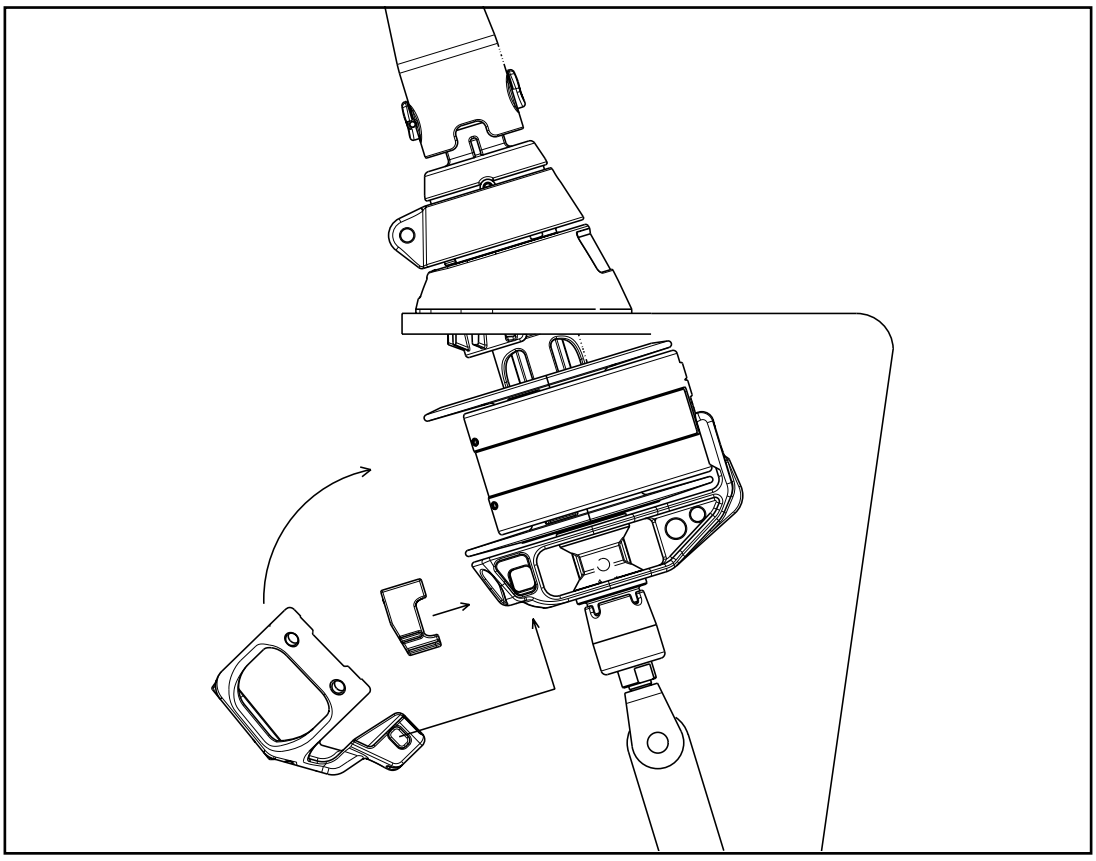
595-240-E
2015-01-15
400 TD

FURLEX

SELDÉN

Manual
Furlex *400 TD*



SELDÉN

1 Introduction

1.1 The manual

☐ To derive the maximum benefit and enjoyment from your Furlex system, we recommend that you study this manual carefully.

☐ The manual is divided into two sections, one dealing with **ASSEMBLY** and one with

☐ **OPERATION**. Each section contains references to the other. It is very important to read and note these cross references.

☐ All safety-related information is indicated by the following symbol:

☐ The manual covers the Furlex size 400 TD. The model designation can be found on the aft edge of the through-deck fitting.

☐ Unless indicated otherwise, all dimensions in the manual are given in millimetres (mm).

This information must be followed to avoid damage to the system and the risk of personal injury. The 2-year guarantee on the Furlex system is only valid if the system is assembled and operated correctly according to the manual.

PLEASE read the entire manual prior to assembly!

Seldén Mast AB guarantees the Furlex system for 2 years. The guarantee covers faults arising from defective design, materials or workmanship.

The guarantee is only valid if the Furlex system is assembled, operated and maintained in accordance with this manual and is not subjected to loads in excess of those indicated in the brochure and instructions.

Complete shipment and warranty conditions are to be found on Seldéns website www.seldenmast.com. See Resources/Partners information/General information/General conditions of sale (595-546-E).

If the system is repaired by anyone other than Seldén Mast AB or one of our authorized dealers, the guarantee ceases to be valid.

Seldén Mast AB reserves the right to alter the content and design without prior warning as well as the right to any future design changes.

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1.2 Product information

When the original Furlex was introduced in 1983, it was not a pioneering project. The design included features which improved on other manufacturers' products to increase performance, function and reliability. The first systems sold are still functioning well, providing ample proof of the design's effectiveness and long-term staying power. Furlex quickly became the market leader, a position it still occupies today. Our success can also be put down to how we select a system for a specific yacht. First we calculate the boat's righting moment, which is a function of its displacement, ballast, beam and draft. Then we use righting moment in combination with the rig type to calculate its power when sailing, and the likely loads on the Furlex-system.

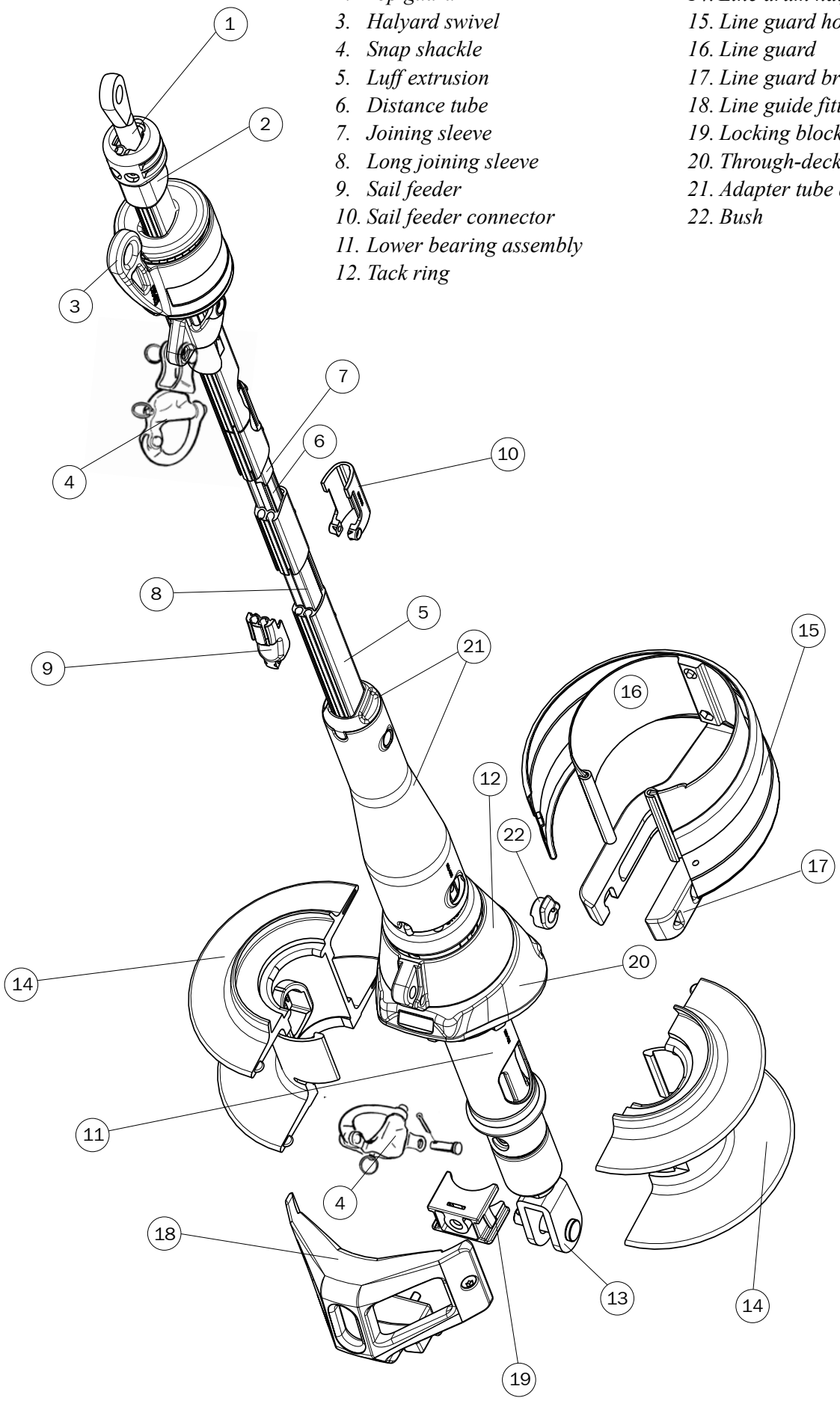
Furlex is only sold through authorized local dealers who are able to cover all service requirements for the customer, including assistance with assembly, the modification of sails or the production of new sails.

This new Furlex model, designed for through-deck assembly, incorporates improvements based on our extensive experience and represents the very latest development of the jib furling and reefing concept.

- ☐ Furlex is supplied as a complete assembly kit containing all the components required.
- ☐ Furlex TD can be separated at the connection between the lower bearing assembly and forestay/ luff extrusion. The lower bearing assembly with line drum etc can be left fitted to the boat even when the forestay/luff section is removed.
- ☐ Furlex TD incorporates an integral screw for fine adjustment of the under deck dimension. This simplifies adjustment if the Furlex is switched to another boat.
- ☐ The ball-bearing system of the halyard swivel features a load distribution facility, a unique patented system which distributes loads over the entire ball race. This promotes smoother furling and considerably reduces bearing wear.
- ☐ The tack ring's "free turn" flattens out the sail, promoting an efficient shape when reefed.
- ☐ Furlex TD is suited to both cruising and racing. As the line drum and the line guard are fitted below deck, the maximum length of the forestay can be utilized.
- ☐ The luff section has two luff grooves, allowing two jibs to be goose-winged when running downwind and facilitating fast sail changes for racing yachtsmen.
- ☐ The aluminium extrusion is insulated from the forestay over its whole length. The extrusion joining sleeves are also insulated internally to prevent wear and corrosion.
- ☐ The line guide fitting centres the line as it is wound onto the drum, and the flexible internal line guard maintains light pressure on the line to ensure even distribution on the drum.
- ☐ Furlex is manufactured by Seldén Mast, the world's leading manufacturer of masts and rigging systems. We hope that you enjoy sailing with your Furlex.

Follow the instructions carefully when fitting.

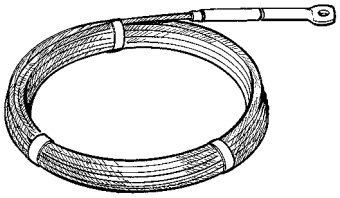
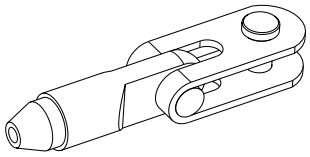
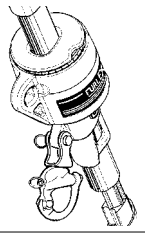
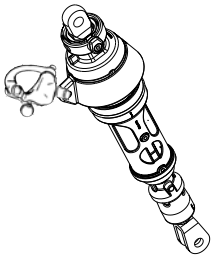
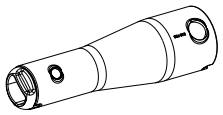
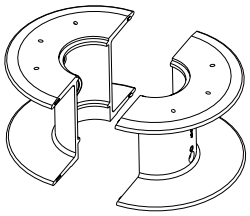
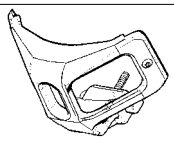
1. *Forestay/eye terminal*
2. *Top guard*
3. *Halyard swivel*
4. *Snap shackle*
5. *Luff extrusion*
6. *Distance tube*
7. *Joining sleeve*
8. *Long joining sleeve*
9. *Sail feeder*
10. *Sail feeder connector*
11. *Lower bearing assembly*
12. *Tack ring*
13. *Adjustment screw (fork)*
14. *Line drum half*
15. *Line guard housing*
16. *Line guard*
17. *Line guard bracket*
18. *Line guide fitting*
19. *Locking block*
20. *Through-deck fitting*
21. *Adapter tube and adapter*
22. *Bush*

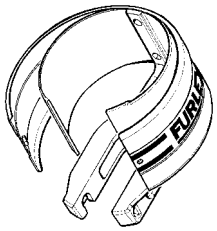
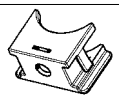
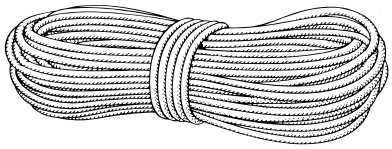
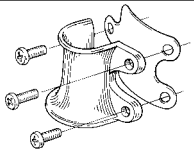
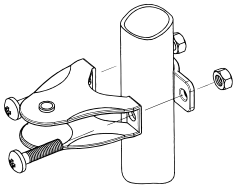
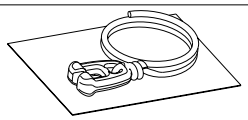
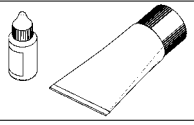
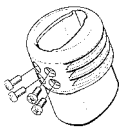


ASSEMBLY

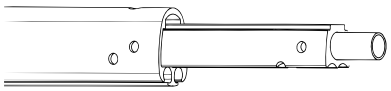
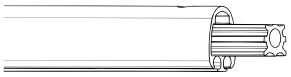
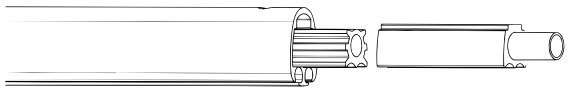
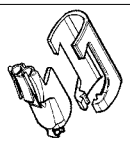
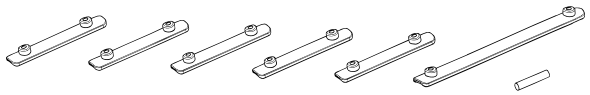
2 Checklist

2.1 Furlex box:

☐ Forestay wire with top bearing.	
☐ Eye terminal with toggle	
☐ Halyard swivel with snap shackle	
☐ Lower bearing assembly with snap shackle	
☐ Through-deck fitting with screws and cutout template for deck hole.	
☐ Adapter tube with adapter and luff section screws	
☐ Two line drum halves	
☐ Line guide fitting	

☐ Line guard housing	
☐ Locking block	
☐ Furling line	
☐ 2 halyard leads 508-128 with insulator sheets incl. 6 screws ☐ Drill bit Ø 5.3 mm (7/32")	
☐ 6 stanchion blocks 538-210-01	
☐ Prefeeder	
☐ Locking adhesive ☐ Lubricating grease	
☐ Top guard incl. 4 screws	
☐ Manuals ☐ Spare parts list ☐ Certificate of guarantee	

2.2 Foil pack

☐ One 660mm (26") luff extrusion with long joining sleeve	
☐ One 1700 mm (67") luff extrusion with distance tube.	
☐ 2400 mm (94 ½") luff extrusions with distance tube + joining sleeve (number dependent on length ordered.)	
☐ Sail feeder (sail feeder + sail feeder connector.)	
☐ One short connecting plate for each 2400 mm (94 ½")luff extrusion ☐ One long connecting plate (for sail feeder) ☐ One locking pin for 660 mm (26") luff extrusion	

2.3 Tools

Tools needed for assembly:

Hacksaw
2 adjustable spanners
Pair of pliers ("Polygrip")
Adhesive tape
File
Marker pen (water-proof)
Set of Torx keys
Set of Allen keys (metric)
Steel measuring tape (20 m) (67')
Knife

For halyard leads:

Heavy-duty Philips screwdriver
Drill
Drill bit Ø 5.3 mm (included in package)

2.4 Tools needed for making the hole in the deck for the Furlex:

Hole saw Ø 152 (6") or jig saw
Drill bit Ø 9 (11/32")

3 ASSEMBLY PREPARATIONS

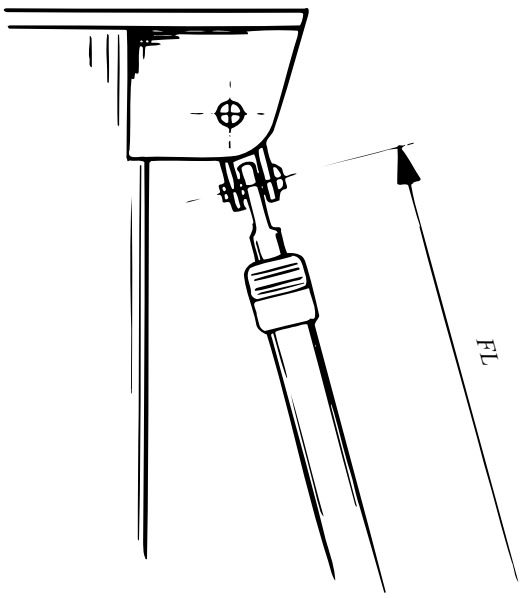
3.1 Forestay attachment - guiding principle

The guiding principle is that the forestay connections should allow sufficient articulation in all directions. In most cases a toggle should be fitted between the Furlex stay and the forestay attachments.

3.2 Mast attachment

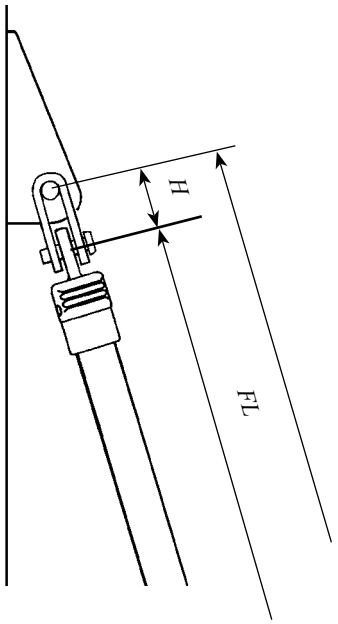
Some Seldén forestay attachment options are shown below, illustrating the rules and exceptions. For H dimensions, see table 3.3.3.

Fig. 3.2.a



Forestay attachment on masthead rigs: always connect the stay with a toggle to give full articulation.

Fig. 3.2.b



Forestay attachment on fractional rigs, Seldén type: connect to existing toggle.

3.2.1 Dimensions of top eye terminal

Furlex Series	Wire Dim.	TED[1)]	TET[2)]
400 TD	Ø 12	20 (25/32")	15 (19/32")
	Ø 14	23 (29/32")	17 (43/64")

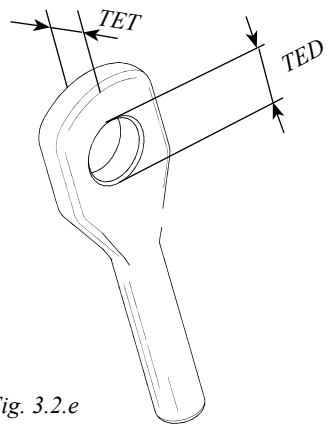
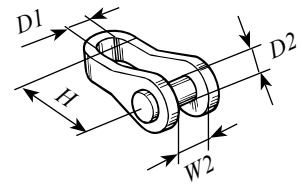
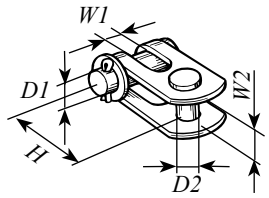
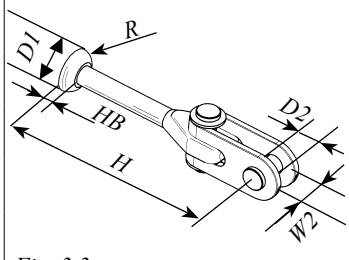
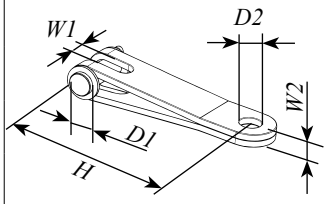


Fig. 3.2.e

[1)] Terminal Eye Diameter
[2)] Terminal Eye Thickness

3.2.2 Dimensions for toggles and extension links

(toggles available from your Furlex dealer)

Toggle type		Forestay dimensions	
		Ø 12	Ø 14
Eye/fork toggle	Article no.	174-125	174-125
	Length (H)	95 (3 ¾")	95 (3 ¾")
	Ø Eye (D1)	20 (25/32")	20 (25/32")
	Ø Clevis pin (D2)	19 (3/4")	19 (3/4")
	Fork width (W2)	22 (7/8")	22 (7/8")
Fig. 3.3.e			
Fork/fork toggle	Article no.	517-052-02	517-053-02
	Length (H)	65 (2 9/16")	80 (3 5/32")
	Ø Riggnit (D1)	19 (3/4")	22 (7/8")
	Fork width (W1)	20.5 (13/16")	20.5 (13/16")
	Ø Clevis pin (D2)	19 (3/4")	22 (7/8")
Fig. 3.3.f	Fork width (W2)	21 (13/16")	23 (29/32")
Stemball / eye toggle with fork/fork toggle	Article no.	517-069-01	-
	Length (H)	226 (8 7/8")	-
	Ø Stemball (D1)	34 (1 11/32")	-
	Height (HB)	8.5 (11/32")	-
	Radius (R)	15 (19/32")	-
	Ø Clevis pin (D2)	19 (3/4")	-
	Fork width (W2)	21 (13/16")	-
Fig. 3.3.g			
Eye/fork extension link	Article no.	517-075-01	517-076
	Length (H)	190 (7 ½")	190 (7 ½")
	Ø Clevis pin (D1)	19 (3/4")	22 (7/8")
	Fork width (W1)	20.5 (13/16")	20.5 (13/16")
	Ø Eye (D2)	20 (25/32")	22.5 (7/8")
Fig. 3.3.h	Gauge (W2)	12 (15/32")	16 (5/8")

3.3 Hull attachment

The lower bearing assembly of the Furlex TD system is to be regarded as an extension of the forestay fitting inside the hull. As it is locked horizontally at deck level, there is a toggle fitted between the lower bearing assembly and the forestay/luff section. This toggle, together with the universal joint function of the adapter tube, will create the required articulation as per the guiding principle item 3.1.

Check that the through-deck fitting does not interfere with the pulpit, navigation lights, bow anchor or other deck fittings.

Check that the anchor well drains freely.

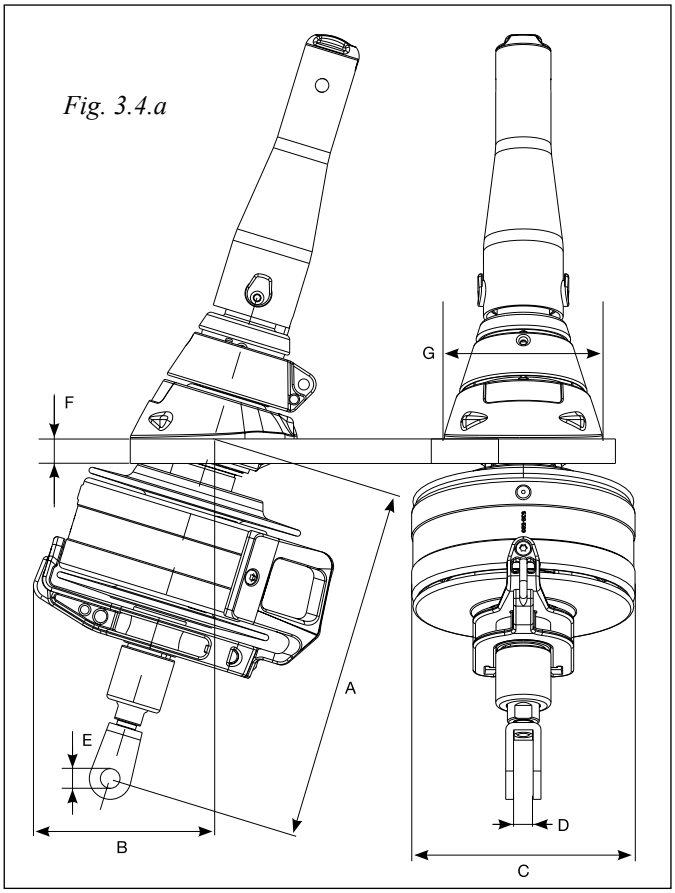
Make sure that the forestay fitting in the anchor well is designed and constructed to take the full forestay load.

3.4 Fitting below deck

3.4.1 Lower bearing assembly

Make sure that there is enough space between the forestay fitting and deck for the lower bearing assembly before the hole is made. (See fig 3.4.a and table 3.4.2 for dimensions of the lower bearing assembly.)

Fig. 3.4.a



3.4.2 Dimensions for installation

	A mm	B mm	C mm	D mm	E mm	F mm	G mm
400 TD	440-630 (17 1/3" ~ 24 13/16)	210 (8 17/64")	255 (10")	22 (7/8")	19 (3/4")	26 (1")	193 (7 19/64")

The dimension F is nominal. In this area the thickness of the deck should not exceed 20 mm (25/32") If the deck is thicker than 20 mm, it should be possible to reduce this with a cavity. This will allow the clearance for the top forward drum edge. If the deck is of sandwich construction, ensure that water cannot enter the core material and cause structural damage.

Furlex TD incorporates an integral screw for fine adjustment of the under deck dimension "A", This simplifies adjustment between different boats. Extra extension links and toggles are available. (For dimensions see table 3.2.2).

For larger gaps: use a custom-made stainless steel bar or rod stay. Short wire pendants are not recommended as the forestay load may not be distributed evenly and wire will not resist the torque which may be produced.

Regarding **"Routing of the furling line"**, see chapter 6.3 for further instructions.

3.5 Location of the through-deck hole

The bearing of the through-deck fitting has a spherical surface which compensates for smaller angle discrepancies between forestay and through-deck fitting. However, it is important to minimize the discrepancies to achieve maximum furling performance. The angle between the forestay and deck must be between 72° and 74°. If the angle exceeds these limits, spacers must be added between the through-deck fitting and the deck, so that the conditions are fulfilled. (See fig. 3.5.a).

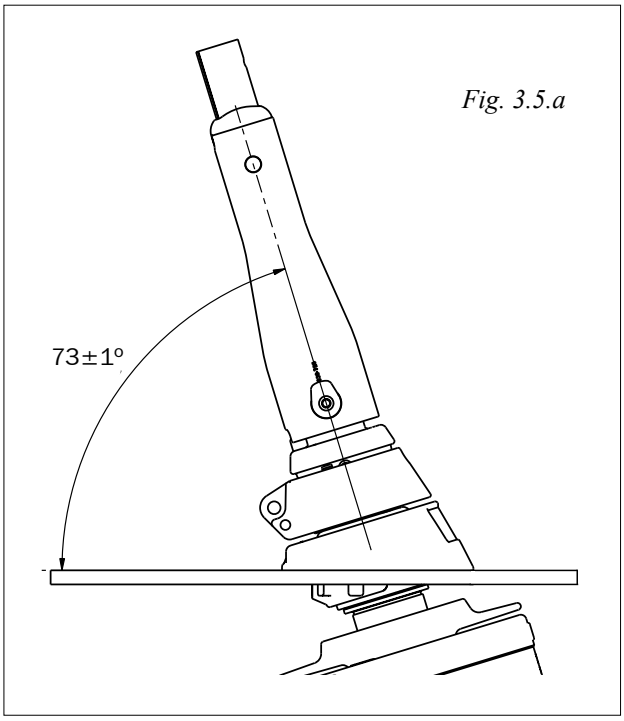


Fig. 3.5.a

3.5.1 How to decide the intersection point of the forestay on the deck

The best method of determining the location of the through-deck fitting is to stay the mast using a forestay which extends though a smaller hole in the deck (See fig. 3.5.b). Two different methods for deciding the intersection point are shown below. For both methods, it is assumed that the deck is of uniform thickness.

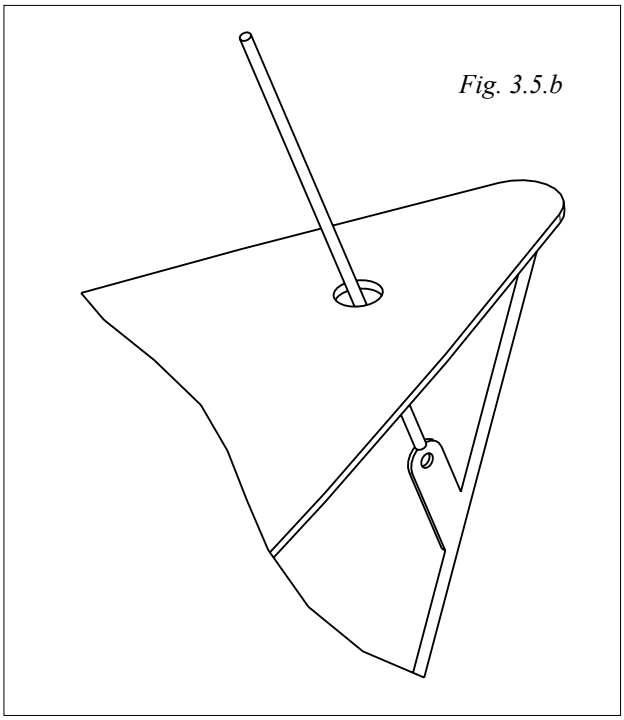
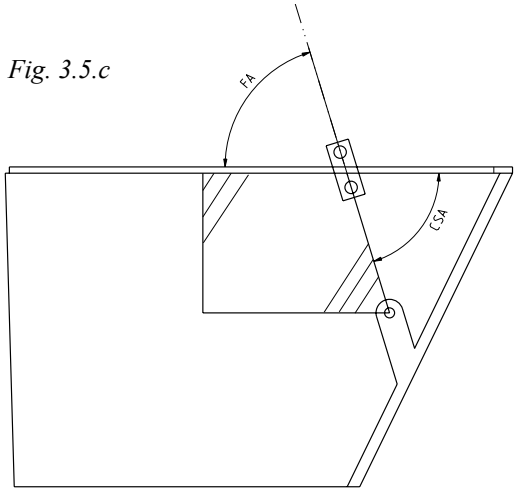


Fig. 3.5.b

3.5.2 Mast is not stepped	3.5.3 Mast is stepped using an existing forestay on deck (where Furlex TD system is to be fitted in the same location)
1. Establish the forestay angle (FA). Use an accurate drawing, which shows details of the area of the deck where the Furlex will be attached, to be able to determine the precise forestay angle (see fig 3.5.c). 2. Transfer this angle to a cardboard jig. 3. Press the jig against the underside of the deck and move it longitudinally until the edge representing the forestay line intersects the hole in the forestay fitting in the anchor well. Mark the intersection point on the underside of the deck and drill a 6.5 (1/4") mm hole through the deck. *Fig. 3.5.c*  	1. Make a jig which represents the forestay angle (FA) above deck (See fig 3.5c) 2. Using this jig, mark the angle CSA between the forestay fitting in the anchor well and the deck fitting intersection point 3. If these angles are equal, the existing forestay fitting is correctly located. If the angles are not equal, the forestay angle FA must be used also below deck to decide the intersection point. Press the jig against the underside of the deck and move it longitudinally until the edge representing the forestay line intersects the hole in the forestay fitting in the anchor well. Mark the intersection point in the fore-and-aft direction accurately. 4. Remove the forestay. The recommended procedure is to first slacken the backstay. Then pull the masthead forward using the genoa halyard. Secure the halyard using a "D" shackle or tie to a strong deck fitting. For safety reasons do not use the halyard snap shackle. NOTE. If the forestay is to be used to decide the forestay length FLD (see fig. 3.7.a), the setting of any rigging screw must not be changed 5. Measure the height CH (see fig 3.7.a) on the forestay fitting and enter the figure in table 3.6.1. 6. Remove the forestay fitting from the deck. 7. Mark the intersection point on the underside of the deck by drawing a line along the longitudinal centreline of the boat and using earlier marking as per item 3. 8. Drill a 6.5 mm hole at the intersection point.
For further fitting work see chapter 4.1.	

Always use a strong "D" shackle or tie the halyard!

3.6 Calculating the length of the forestay wire

(The following is valid for a yacht with the mast stepped.)

1. Determine the rake of the mast with the fore-/backstay tensioned.
2. Slacken the backstay as much as possible, but make sure that any rigging screw is not unscrewed so far that the threads are no longer visible "on the inside". The forestay setting should not be adjusted. If the forestay rigging screw must be adjusted, first mark its thread with adhesive tape.
3. Pull the masthead forward using the genoa halyard. Secure the halyard using a "D" shackle or tie it to a strong deck fitting. For safety reasons, do not use the halyard snap shackle.

> ⚠ **Always use a strong "D" shackle or tie the halyard!**

4. Take down the forestay. If the rigging screw was adjusted, return it to its original setting.
5. Measure the forestay length (FL) with just enough tension to keep it straight.
6. Enter the measurement in Table 1 below, under the heading "Your forestay", in the row marked FL.
7. Calculate the new wire length WL in Table 1. Refer to the column marked "example" and fig. 3.7.a to see how this is done.

3.6.1	Table 1: Calculation of forestay wire length	Your forestay	Example (400 TD/Ø12)
FL	Existing forestay length FL including rigging screw, no tension. (See fig. 3.5.a)		21.500
CH	Add the distance between the hole in the chain plate and deck level. The measurement to be taken along the forestay line. (See fig. 3.5.c)	+	+ 100
FLD	FL + CH = FLD. = FL also corresponds to any measurement taken from the rig drawing of the boat.		21.600
TDH	Deduction for the level of Furlex TD above deck **TD-deduction** Ø 12 mm wire: 250 mm (9 27/32") Ø 14 mm wire: 250 mm (9 27/32")	-	- 250
NFL	New forestay length =		21.350
T	Deduction for wire terminal + toggle **TD-deduction** Ø 12 mm wire: 110 mm (4 1/3") Ø 14 mm wire: 135 mm (5 5/16")	-	- 110
WL	Cutting measurement. The new forestay wire is to be marked at this point.	=	= 21.240

3.7 Calculating the length of the luff extrusion

1. Insert the length of the new forestay wire (WL) as calculated in "Table 1" into "Table 2", in the row marked WL under the heading "Your extrusion".
2. Calculate the number of full length extrusions and the length of the top extrusion.

3.7.1	**Table 2: Calculation of luff extrusion length**	**Your extrusion**	**Example (400 TD/Ø12)**
WL	Length of new forestay wire (as per **Table 1**)		21.240
A + B	Fixed deduction (A+B): **A+B deduction** Ø 12 mm wire: -950 mm (37 13/32") Ø 14 mm wire: -940 mm (37")	-	- 950
C+D	C+D=		20.290
C	Max. number of 2400 mm (94 ½") extrusions which together are shorter than C+D: (.....ex x 2400 = C) C=		(8 extrusions) 19.200
D	Length of top extrusion = The top extrusion is normally cut from the 1700 mm (67") extrusion. Round the edges of the cut end using a file. If the top extrusion is shorter than 700 mm (27 9/16"), the joint will be too near the top. In this case replace the uppermost full-length 2400 mm extrusion with the 1700 mm (67") extrusion. In this way the joint is moved 700mm down the stay. Adjust the C and D measurements as follows: Deduct 700 mm (27 9/16")from the C measurement. Add 700 mm (27 9/16") to the D measurement.		1.090
E	**E deduction** Ø 12 mm wire: -510 mm (20") Ø 14 mm wire: -560 mm (22") Deduction: Length of distance tube E=	- =	- 510 = 580

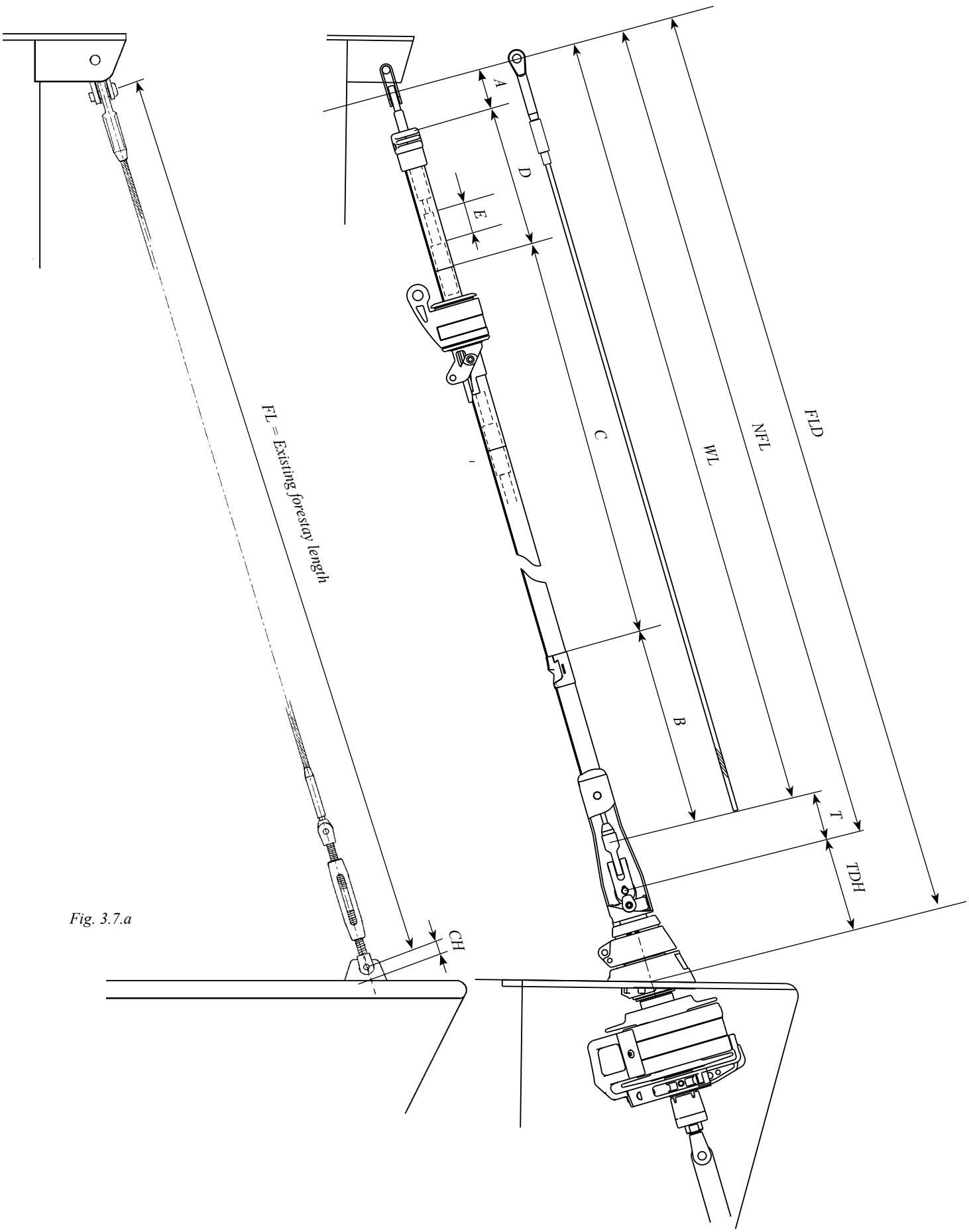


Fig. 3.7.a

4 Assembly of the Furlex system

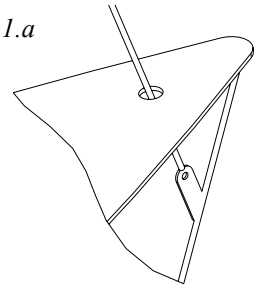
4.1 Making deck hole and fitting of through-deck fitting

The best way to decide the location of the through-deck fitting is to step the mast with a forestay, which passes through a smaller hole in the deck. If using this procedure follow the instructions below starting at item 1. If making the hole for the through-deck fitting is the first step, start at item 5.

1. Using the 6.5 mm (1/4") hole at the intersection point (see fig. 3.5.3) as its centre, cut a Ø 50 mm (2") hole in the deck.

2.

Fig. 4.1.a

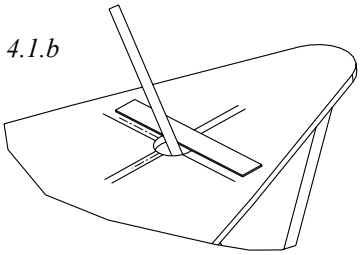


Step the mast and use a genoa halyard (the one intended for the Furlex) as forestay. Lead the halyard through the hole in the deck and attach it to the hole in the forestay fitting Attach the halyard with a D-shackle fitted to the halyard with a knot or talurit. If the halyard is fitted with a snap shackle this should not be used for safety reasons.

NOTE! Always use a strong "D" shackle or tie the halyard!

3.

Fig. 4.1.b

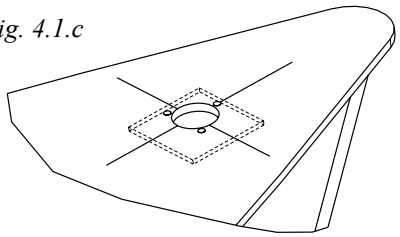


Mark the position of the halyard on the edge of the 50 mm (2") hole longitudinally as well as laterally.

4. Take the tension off the genoa halyard, using another halyard. Disconnect the first genoa halyard.

5.

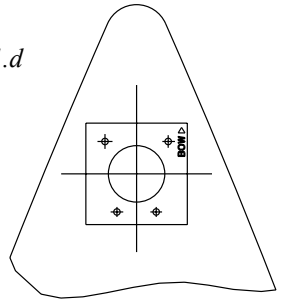
Fig. 4.1.c



Fit a piece of plywood or similar, using 3 screws as per fig. 4.1.c. Locate the screws close to the hole edge to provide clearance for the jigsaw/hole saw. Note: To make the markings more precise, the 50 mm (2") hole in a deck of more than 5 mm (3/16") should be filled with a piece of wood and "quick curing " filler.

6.

Fig. 4.1.d



Put the enclosed hole jig on top of the hole: Check that the jig reference lines coincide with the deck markings. Secure the jig with adhesive tape.

7. Drill the large hole using a hole saw or jigsaw. Do not make the hole too big. File if required. Also drill the holes for the fitting screws (see Table 2.4 for correct dimensions).
8. Fit the through-deck fitting. The screws must engage into the fitting by 15-17 mm (2/3"). Also check that the through-deck fitting rests against the aft edge of the large hole.

4.2 Fitting of the lower bearing assembly to the boat

1. Guide the lower bearing assembly through the deck fitting. Undo the adjustment screw a little extra and connect the fork to the forestay fitting. (If extension links or similar are to be used see instructions in chapter 3.4.1).

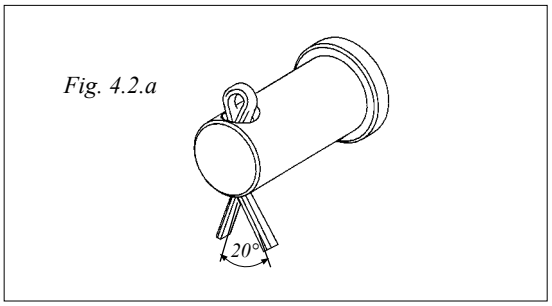


Fig. 4.2.a

2. NB: Turn the adjustment screw A so that the lower edge of the tack ring is about 4-5 mm (3/16") from the through-deck fitting. Pull the tack snap shackle upwards and rotate the tack ring between its end stops. Check that the ring does not touch the through-deck fitting at any point. Adjust if required.

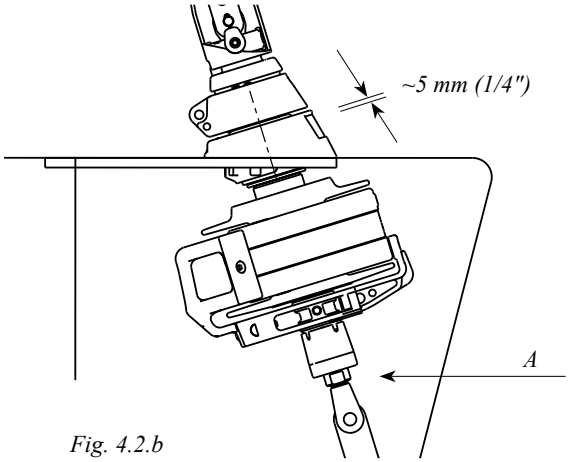


Fig. 4.2.b

4.3 Fitting the line drum and line guide

The line drum consists of two halves, which are each attached to the lower bearing with screws.

1.

Feed the furling line through the hole in the line guide fitting and then through the hole in the line drum half which has a clip fitted.

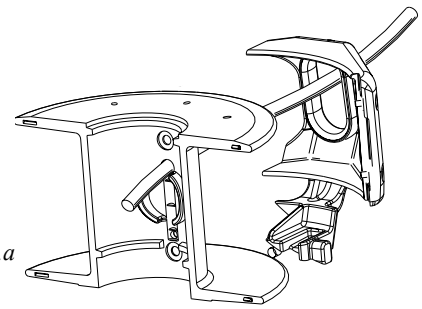


Fig. 4.3.a

2.

Bend the end of the line down so that it covers the inspection hole ① in the line drum half.

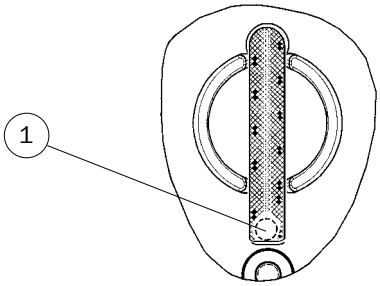


Fig. 4.3.b

3.

Start by fitting the line drum half with the line on the lower bearing assembly first. Tighten the screws properly, thus locking the furling line. Check that the end of the line is visible through the inspection hole. If not, undo the line drum halves and place the line in the position shown in fig. 4.3.b.

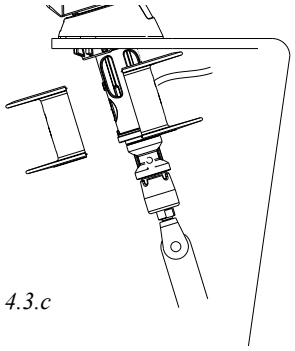


Fig. 4.3.c

4

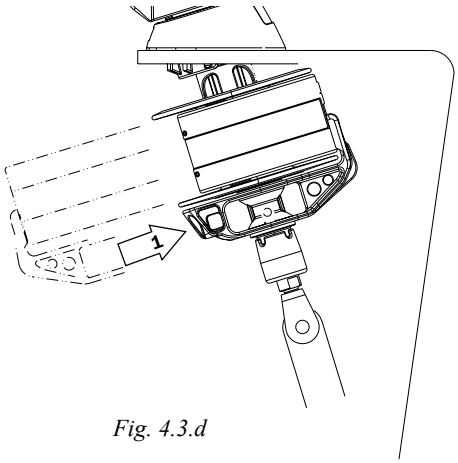


Fig. 4.3.d

Slide the line guard on from aft and turn it half a revolution.

5

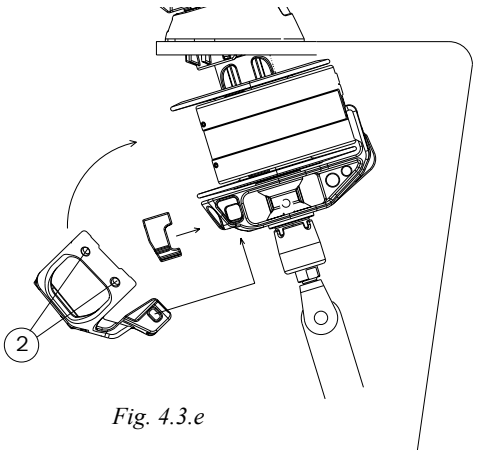


Fig. 4.3.e

Press the locking block in from aft until it rests against the lower bearing assembly. Hook the line guide fitting on to the line guard and bring this up into position. Tighten the screws ② in the stainless steel line guard housing.

6. Tighten the screw ③ lightly.

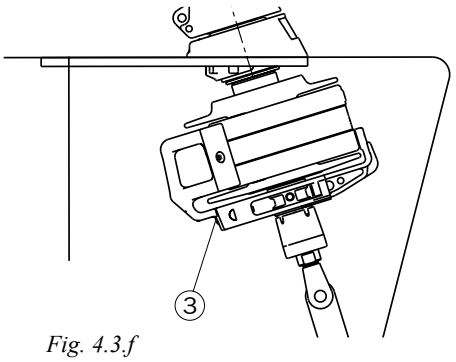


Fig. 4.3.f

7.

Adjust the line guide vertically so that it is midway between the line drum flanges. If the casing or line guard come into contact with the line drum flanges, unnecessary friction will be caused.

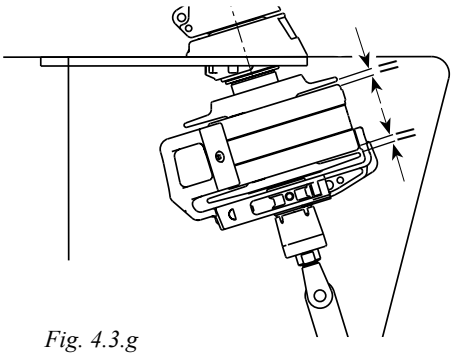


Fig. 4.3.g

8.

Adjust the alignment of the line guide towards the lead block and tighten the screw. (See also chapter 6.3, **"Furling line arrangement"**.)

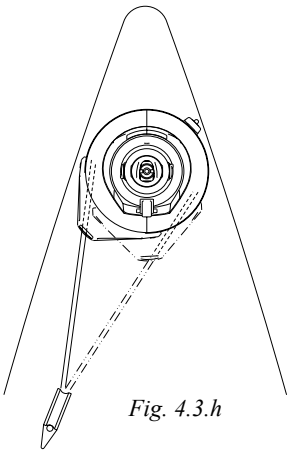


Fig. 4.3.h

At this stage the furling line arrangement should be fitted. See "Routing of the furling line", chapter 6.3 for instructions. After the line is fitted, the line guard should be carefully re-aligned and the locking screw permanently tightened.

4.4 Assembly of the luff section

Assembly should be carried out on a horizontal surface. Connect the luff extrusions one by one as follows:

1.

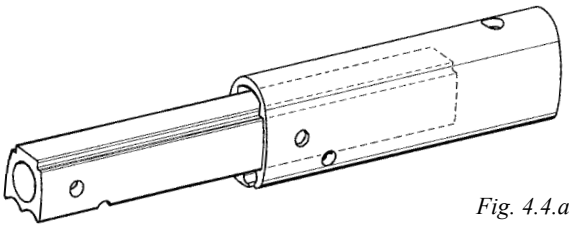


Fig. 4.4.a

The long joining sleeve must be in the 660 mm (26") luff extrusion when commencing assembly.

2.

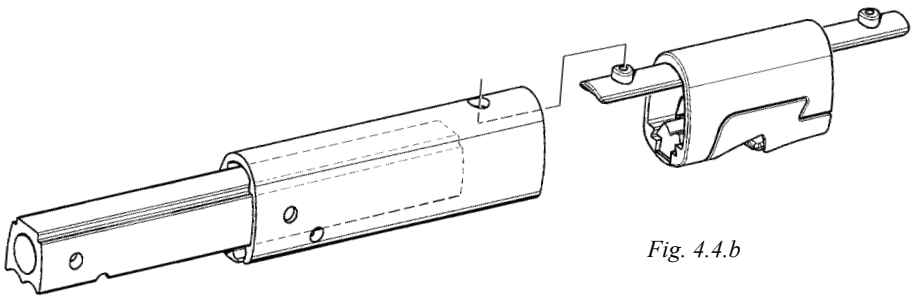


Fig. 4.4.b

Fit the long connecting plate at the same time as the sail feeder as shown in the diagram. Push the joining sleeve up so that it is flush with the top edge of the sail feeder.

3.

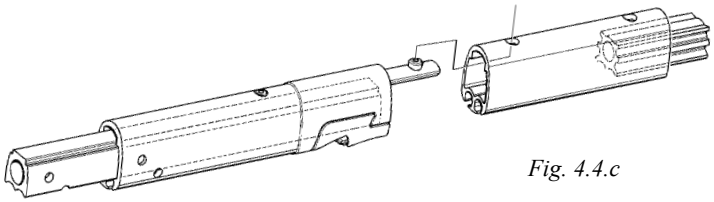


Fig. 4.4.c

Remove the 300 mm (11 ¾") joining sleeve from a 2400 mm (94 ½") extrusion (this joining sleeve is to be used later for the top extrusion). Connect the 2400 mm (94 ½") extrusion to the 660 mm (26") extrusion. Push the long joining sleeve of the 660 mm (26") extrusion into the 2400 mm (94 ½") extrusion until it lies flush with the lower edge of the 660 mm (26") extrusion.

4.

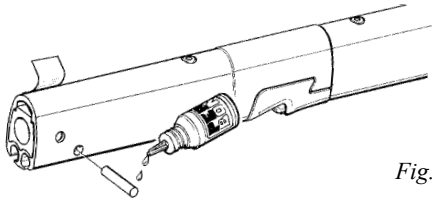


Fig. 4.4.d

Place the collar of the adapter tube onto the extrusion. Insert the locking pin together with the locking adhesive. Secure the pin with a piece of adhesive tape. (The tape is removed when the adapter tube/adapter is slid on).

Note: Do not allow locking adhesive to come into contact with the skin!

5.

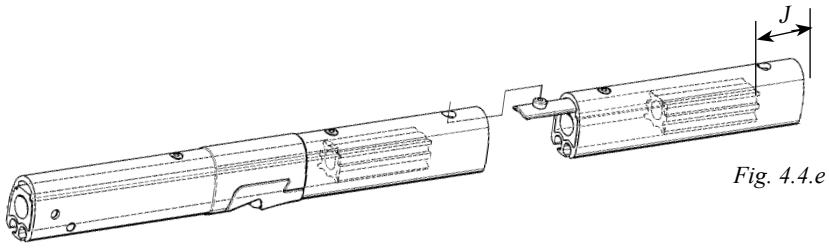


Fig. 4.4.e

Fit a joining sleeve into the next 2400 mm (94 ½") extrusion together with a connecting plate. Connect this to the lower extrusions. Using a spare joining sleeve, push in the distance tube from the top until the lower joining sleeve touches the distance tube below the join. Check that the distance (J) between the end of the distance tube and the end of the extrusion is approximately half the length of a joining sleeve.

6.

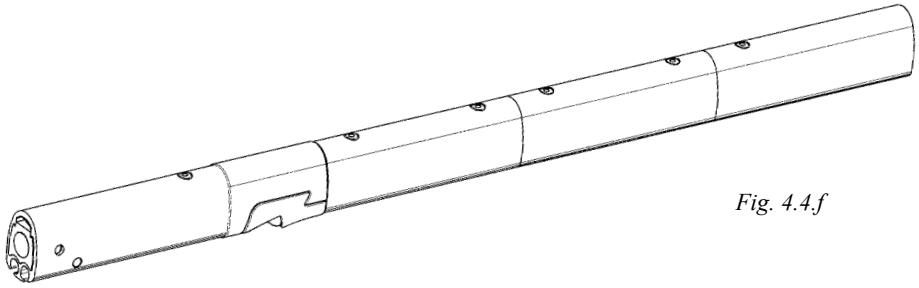


Fig. 4.4.f

Connect the remaining extrusions according to **"Table 2"** (chapter 3.7.1).

7.

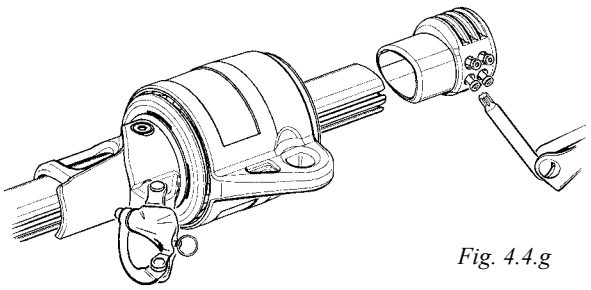


Fig. 4.4.g

Fit the halyard swivel over the top end of the extrusion, slide it down as far as the sail feeder and secure it in this position with adhesive tape. Fit the top guard and secure it with the two pre-fitted screws. Tighten the screws until they bottom, but do not over-tighten.

8.

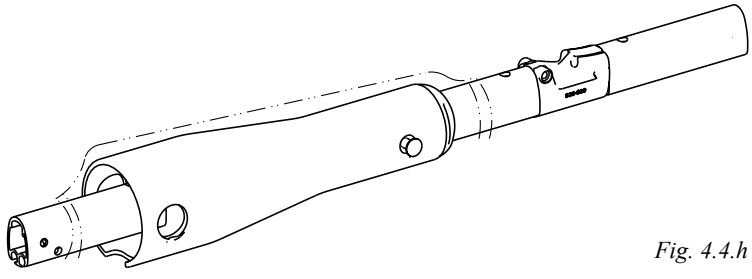


Fig. 4.4.h

Feed the torque tube and adapter onto the luff section, taking care to avoid scratches. Wrap protection around the torque tube to avoid scratches to the polished surface and temporarily secure it in the position shown above.

4.5 Fitting the wire

1. Stretch the Furlex wire out by hand on a flat surface. Be careful when you open the wire coil as it may uncoil quickly.

> ⚠ **NOTE! Be careful when you open the wire coil!**

2. Measure the wire from the centre of the hole in the terminal end fitting. Mark the measurement WL carefully on the wire using a marker pen. (The WL measurement was calculated in **"Table 1"**, chapter 3.6.1).
3. The wire is annealed and tapered, making it easier to fit into the extrusion. **Do not cut the wire yet.**
4. Feed the wire through the luff extrusions from the top until the eye of the end fitting stops against the top guard. Secure it in this position with adhesive tape. If the wire catches inside the extrusion, turn it counter-clockwise until it passes the obstruction.
5. Put adhesive tape around the wire on both sides of the cutting mark to assist cutting. Check that the measurement between the cutting mark and the bottom edge of the 660 mm (26") extrusion is as shown in the following table 4.5.1.

4.5.1	Wire should protrude:
400 TD	Ø 12 mm wire: approx 170 mm (6 3/4")
	Ø 14 mm wire: approx 145 mm (5 3/4")

6. Cut the wire. Round the end of the wire using a file.

7.

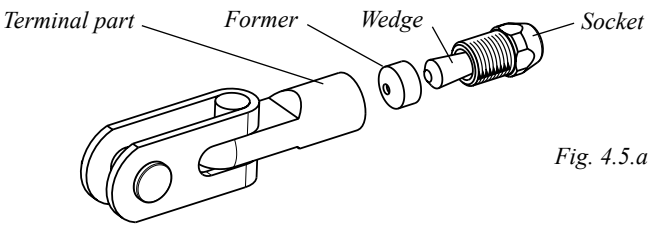


Fig. 4.5.a

Unscrew the socket, wedge and former from the terminal part.

8.

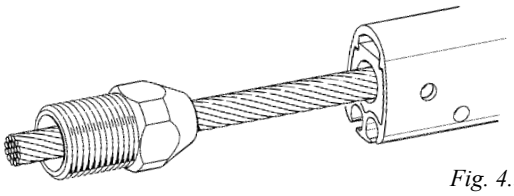


Fig. 4.5.b

Thread the socket onto the wire.

9.

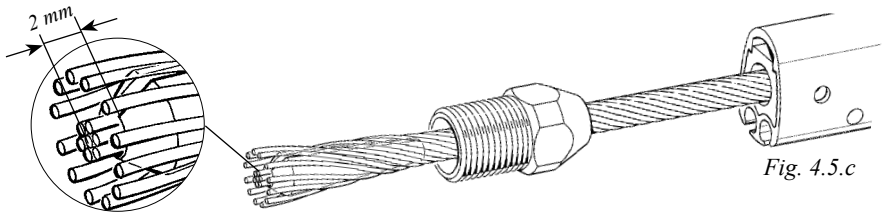


Fig. 4.5.c

Slide the wedge over the core of the wire. The core of the wire should protrude approx. 2 mm (5/64") from the wedge.

10.

Space the outer strands of the wire evenly around the wedge and bring down the socket so that the strands are held in place. Hold an adjustable spanner between the extrusion and the socket. Tapping the core of the wire, locate it firmly in the socket. Check that the core of the wire protrudes approx. 2 mm (5/64") from the wedge. See fig. 4.2.c.

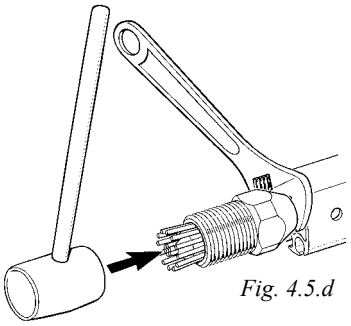


Fig. 4.5.d

NOTE! Check that no strand slipped into the slot of the wedge.

11.

Bend the outer strands inwards a little using a pair of pliers, or tap the strands with a small hammer. In the latter case, rest the socket's thread on a soft surface (wood or similar) to prevent damage.

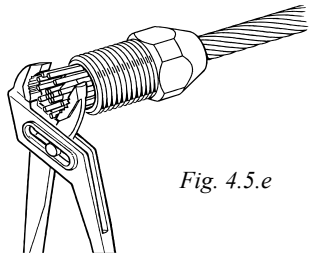


Fig. 4.5.e

12.

Insert the former into the threaded hole of the terminal part. Lubricate the socket's thread with a long bead of locking adhesive. Screw the terminal part onto the socket and tighten carefully, forcing the wire further into the terminal.

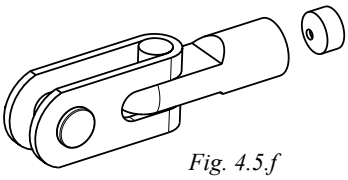


Fig. 4.5.f

13.

Unscrew and check that the outer strands are evenly distributed around the wedge. If some strands are crossed, correct their positions.

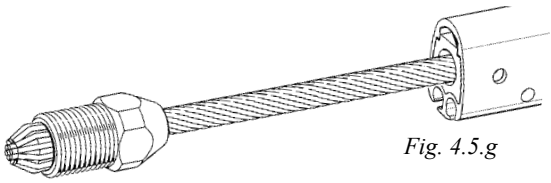


Fig. 4.5.g

NOTE! Check that no strand has slipped into the slot of the wedge!

14. If assembly is unsuccessful and needs to be repeated, refer to the relevant sections of chapter 17, **"Dismantling the Furlex"**.

15.

Apply another 2 or 3 drops of the locking adhesive to the thread and screw the terminal together, tightening it firmly. The terminal is now permanently locked.

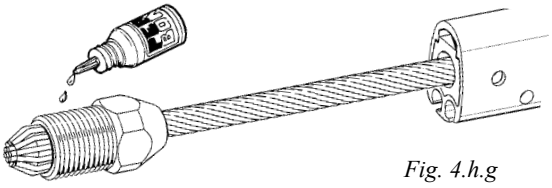


Fig. 4.h.g

16. Check length NFL of the stay is according to **"Table 1"** (chapter 3.6.1) & fig. 7.a.

17

Mark the 660 mm (26") extrusion with a permanent marker as shown. This will assist final alignment with adapter + adapter tube.

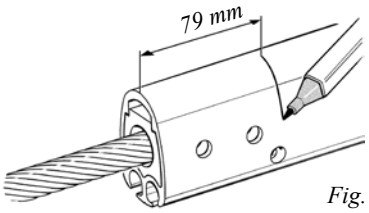


Fig. 4.5.i

18.

The luff section unit is now ready to fit to the boat.
See **"Rigging"**, chapter 16.

5 Halyard routing ⚠

Halyard routing is one of the most important things to attend to for correct assembly.

The angle between the halyard and the forestay must be 5–10°, see fig: 5.4.e. If this angle is less, the halyard may wrap around the luff section when the sail is being furled, possibly damaging the halyard and the luff extrusion. Failure to observe what is happening in this situation may even result in damage to the forestay wire.

⚠ **Incorrect halyard routing can promote "halyard wrap" which may cause severe damage to the forestay, and put the entire rig at risk. If the sail is furled with the aid of a winch, take great care. It can be difficult to control the tension on the furling line.**

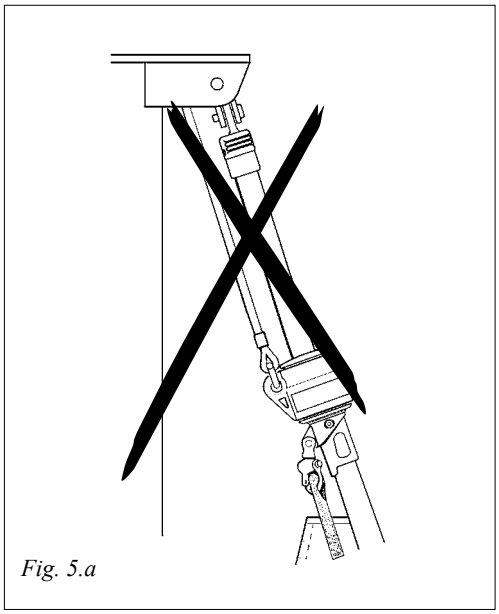


Fig. 5.a

May lead to

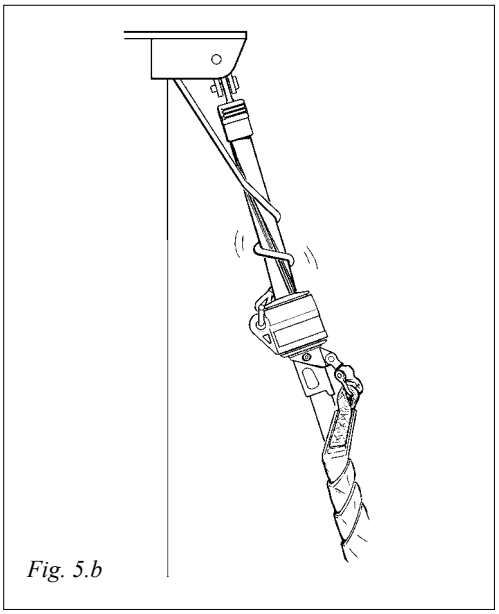


Fig. 5.b

5.1 Halyard leads

To avoid halyard wrap, 2 halyard leads are included in the Furlex kit. These are easy to fit and are suitable for all makes of mast.

When sailing, movement occurs between the wire halyard and the halyard lead. To prevent halyard wear, the halyard lead is made of bronze. This is "softer" than a wire halyard, so the halyard lead will wear before the wire. Halyard leads should therefore be inspected once a year and any sharp edges smoothed with a file. The halyard lead should be replaced when wear reaches 50%. The halyard leads are not covered by the 2-year Furlex warranty.

5.2 Halyard sheave box

A sheave box can also be fitted to the mast to meet the 5–10° requirement. The sheave box will not damage the halyard, nor is it worn by the wire. Installation is more complicated but the box will eliminate the need to replace the halyard leads in future.
Newly manufactured Seldén masts on which Furlex is to be fitted are always fitted with a sheave box. Sheave box kits with assembly instructions are obtainable from all Furlex dealers.

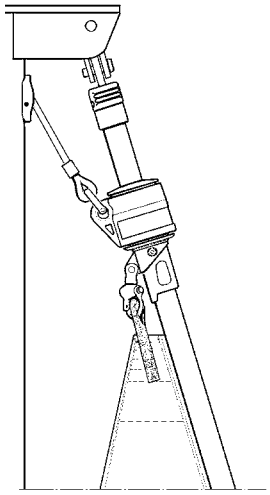


Fig. 5.2.a

5.2.1 Wire halyard	**Ø 7** (9/32")	**Ø 8** (5/16")
Rope Halyard dimension	Ø 14 (1/2")	Ø 16 (5/8")
Sheave box	AL-90	Ø 130
Article no.	505-012-10	505-038-01
Sheave width	16 mm (5/8")	20mm(25/32")

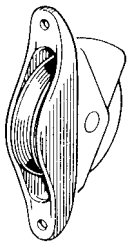


Fig. 5.2.b

5.3 Spinnaker halyard

If the boat is equipped with a spinnaker halyard, this must be kept clear of the Furlex system to avoid halyard wrap. An effective solution is to lead the halyard around the upper shroud and then down aft the spreaders.

Stowing a spinnaker halyard parallel to the Furlex stay is not recommended!

5.4 Fitting the halyard lead

The Furlex kit contains 2 halyard leads. If the mast is equipped with two genoa halyards they should each run through a halyard lead. The halyard leads can be fitted side by side or moved round the side of the mast if there is a lack of space

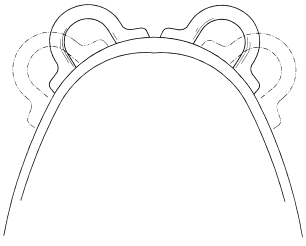


Fig. 5.4.a

Each lead is supplied with a self-adhesive insulator sheet. It is important to fit this between the lead and the mast. The lead, which is made of bronze, can otherwise cause corrosion damage on the aluminium mast surface.
Figs. 5.4.c–5.4.e give the fitting measurements for Seldén masts. These measurements can also be used for other makes of mast, but the angle must be checked carefully. Too great an angle may result in unnecessary wear to the halyard lead.

For the halyard routing to work properly, the halyard swivel must be in the correct position to achieve the required angle of 5–10°.
If the sail does not have the required luff length, this needs to be adjusted. (See Sail, 7.1.)

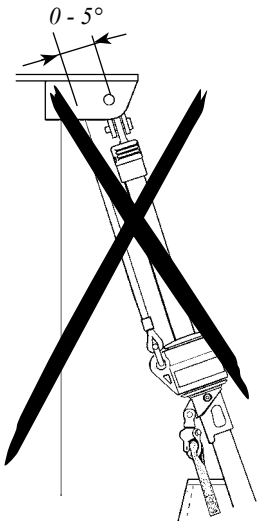


Fig. 5.4.b

10° Halyard angle. No lead is needed.

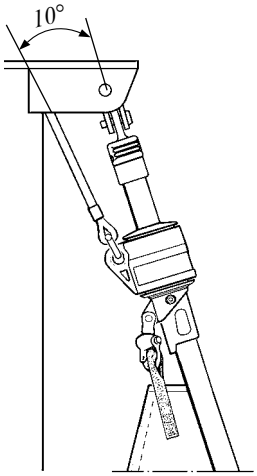


Fig. 5.4.c

Masthead with halyard leads.

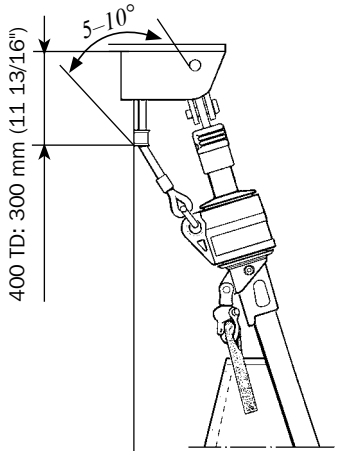


Fig. 5.4.d

Triple combi (fractional rig) with halyard leads.

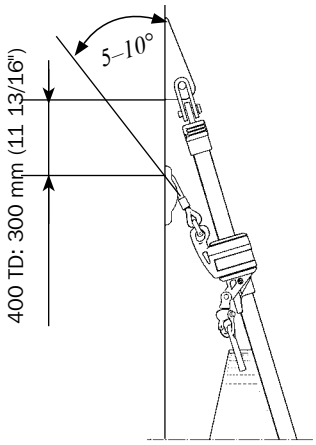


Fig. 5.4.e

Fitting instruction:

1. Measure the position of the leads. Mark the position with the self-adhesive insulator sheets.
2. Drill the holes with the enclosed Ø 5.3 mm (7/32") drill bit, using the fitting as a jig. It is easiest to drill the holes before the Furlex stay is fitted.
3. Fit the halyard leads "over" the respective halyard as the halyard shackles are too big to be fed through the eye.
4. Lubricate the screws with grease and mount the halyard leads. The screws are self-tapping M6 screws which can be screwed directly into the Ø 5.3 mm (7/32") hole. The grease makes fitting easier and prevents corrosion.

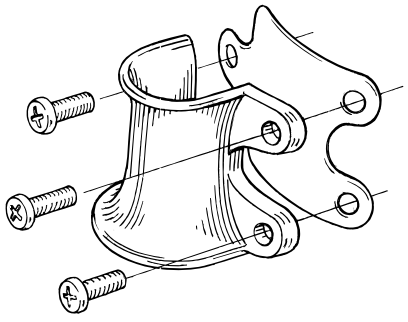


Fig. 5.4.f

6 Furling line arrangement

6.1 Functional description

As the sail unfurls, the furling line is wound onto the line drum. It is centred on the line drum through the hole in the line guide fitting, which has a stainless steel bush to reduce friction and wear on the line. The furling line is distributed evenly on the line drum by the light pressure exerted on it by the flexible line guard, which has low friction aluminium edge protectors.

6.2 Winding the line onto the drum

☐ Turning the luff extrusion by hand, wind approx. 40 turns of the furling line onto the line drum.

If the sail's ultraviolet (UV) protection is fitted on the *starboard side*, the furling line shall exit on the port side of the line drum. Turn the luff extrusion *clockwise*.

If the UV protection is fitted on the *port side*, turn the extrusion *counter-clockwise*. The line will then exit on the starboard side.

☐ Secure the line in the tack snap shackle. Accidental unfurling is then prevented.

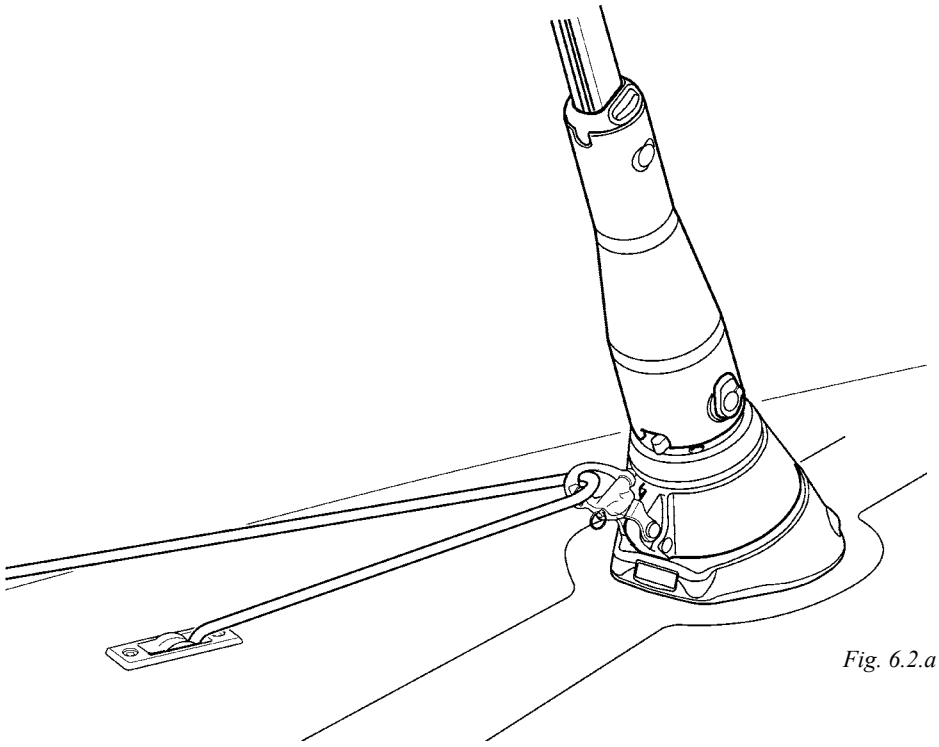


Fig. 6.2.a

To prevent accidental unfurling the line can be secured as shown in fig. 6.2.a.

6.3 Routing the furling line

The illustration below shows a model arrangement of the furling line routing inside an anchor well to achieve maximum furling performance. The turning block inside the anchor well and the sheave box required to lead the line through the deck are not included in the Furlex package as these parts must often be individually adapted for each boat.

- ☐ The furling line must enter the line drum perpendicular to the forestay. There must be at least 300 mm from the drum to the first turning point of the line to make the line furl evenly on the drum
- ☐ Blocks with large sheaves on roller bearings are recommended to minimize friction losses. (Avoid leading the line through tubes incorporated in the deck as this increases the risk of friction on the furling line.)
- ☐ Strength requirement: to cope with the loads for which the Furlex system is designed, the turning block below deck and through-deck passage sheave house must have a safe working load of not less than:

  Wire Ø12: 12 000 N
  Wire Ø14: 18 000 N
- ☐ When the line is fitted the line guide is finally aligned and the locking screw is permanently tightened.(See **"Assembly of line drum and line guide"** chapter 4.3)

Fig. 6.3.a

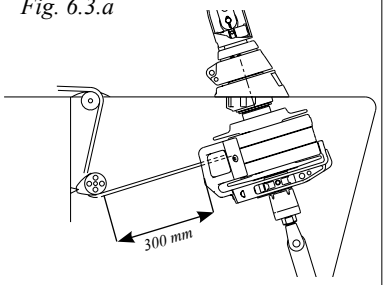
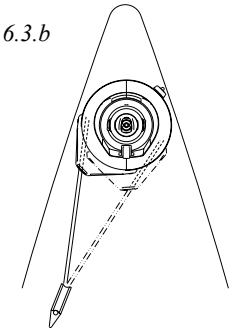


Fig. 6.3.b



The line should be led aft to the cockpit via the lead blocks included in the Furlex package. The lead blocks are mounted on stanchions and the pulpit. See fig: 6.4.a (next page) for installation instructions.

The final turning block by the cockpit is not included in the Furlex kit.

This needs to be matched individually to each boat depending on the attachment points, the line arrangement chosen and possibly also the type of other blocks on the boat.

We recommend a swivel block which is free to self-align.

The maximum working load of the block should not be less than:

Wire Ø12: 17 000 N (3820Lbs)
Wire Ø14: 25 000 N (5620Lbs)

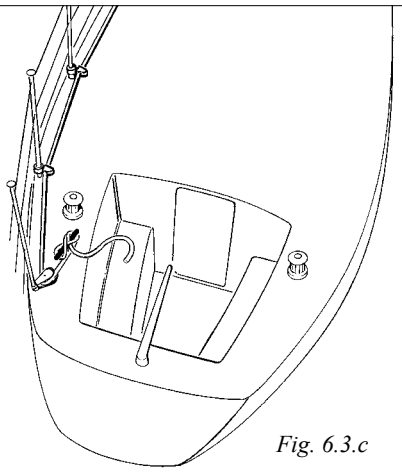


Fig. 6.3.c

It must be possible to belay the furling line securely. A block with a Cam-cleat works well when securing a reef, but is unreliable if the boat is left unattended.
The line should then be secured on a normal cleat for safety reasons. We recommend a single turning block in combination with a cleat.

If the furling line is accidentally released, the sail may unfurl and flap unchecked in strong winds. It could be damaged irreparably!

6.4 400 TD: Fitting the lead blocks

The Furlex kit contains 1 articulated block to be fitted preferably on a Ø25 mm (63/64") pulpit and 4 fixed stanchion blocks for fitting on a Ø25 mm (63/64") stanchion. The fixed blocks can also be fitted on Ø30 mm (1 3/16") stanchions, but the standard screws must be replaced by M6-25 mm screws.

Assembly:
The blocks are fitted on the stanchions as shown in fig. 6.5.a. The screw heads should be turned in towards the boat.

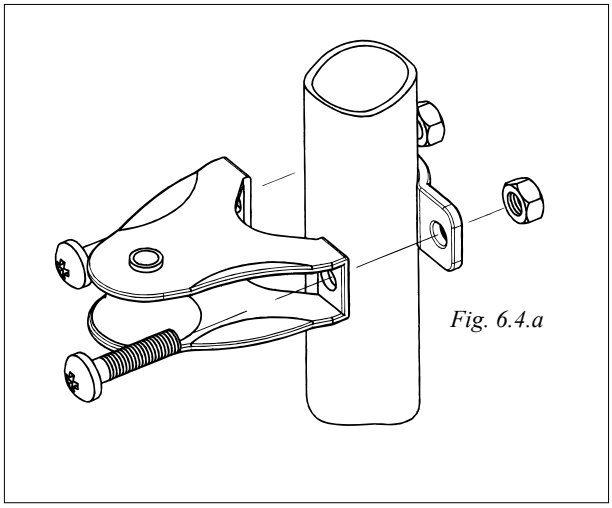


Fig. 6.4.a

7 The Sail

7.1 Adapting the sail to the Furlex system

☐ To fit the Furlex system, an existing sail may need to be modified. The maximum luff length is calculated as shown in table 7.1.1 and fig: 7.1.b. FLD - (F+E) (existing forestay length FLD as per table 3.6.1 – less head and tack deduction).

It is most important that the halyard swivel is located so that the halyard satisfies the 5–10° angle requirement. If the sail prevents the swivel from reaching the correct position, the luff length needs to be adjusted.

IF THE SAIL IS TOO LONG: Shorten the sail, e.g. in conjunction with changing to a luff tape compatible with Furlex.

IF THE SAIL IS TOO SHORT: Lengthen the sail by means of a wire pendant fitted to the head of the sail. Attach the pendant directly to the sail by a talurit splice to prevent unintentional removal, loss or exchange. All the boat's foresails should be adjusted to the correct luff length (see chapter 7.3). There must be a minimum distance of 80 mm between the top of the halyard swivel and the top guard when the sail is fully tensioned.

☐ "Cutback" for tack see table 7.1.1.

☐ The luff tape must be compatible with the Furlex luff extrusion. See luff extrusion measurements in table 7.1.1.

☐ If the sail is to be fitted with UV protection, this is best placed on the starboard side. The tack of the sail will then be in line with the luff grooves of the luff section when unrolled (see chapter 12, **"Reefing"**). If the sail already has UV protection on the port side, the tack will be turned slightly to starboard. The free turn of the tack ring will function equally well.

☐ Use webbing loops at the sail head and tack instead of eyes (cringles). The sail will then form tightly round the luff extrusion when furling, and achieve a better shape when reefed.

7.1.1 Table of sail measurements

Furlex type	400 TD
Head deduction F	620 (24 7/16")
Tack deduction E (any additional toggle or link must be added to E)	210 (8 ¼")
Cutback	95 (3 ¾")
Internal diameter of luff groove DLG	Ø 8 (5/16")
Width of luff groove WLG	3.0 (1/8")
Overall extrusion dimensions	48.5x34 (129/23"x111/32")

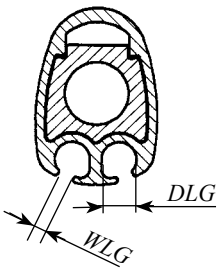


Fig. 7.1.a

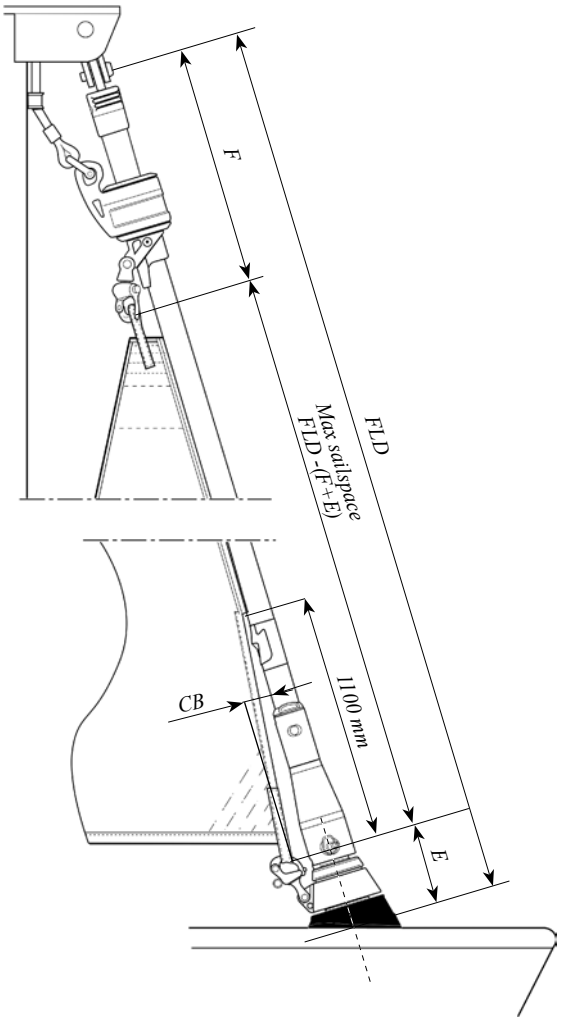


Fig. 7.1.b

7.2 Sail shape

The design of a sail can vary depending on its intended use and the desired performance.

The clew of the sail can be high or low.

In most cases a genoa has a low clew, with the foot sweeping as close to the deck as possible. To achieve the optimal trim of a reefed sail you must be prepared to adjust the sheeting point.

Smaller foresails such a cruising jib will have a higher clew, giving better visibility under the sail, easier passage over the guard rail and less exposure to waves breaking over the foredeck in heavy weather. This type of sail often requires less adjustment of the sheeting position when reefed (See chapter 12, **"Reefing"**).

A furling genoa is usually a compromise between optimum performance and a more practical sail. The sail is designed for both light and strong winds, and is cut with less draft, giving it a flatter shape when reefed.

Several methods have been developed to improve the shape of a reefed sail. Many sailmakers use "foam" as a filling material along the luff of the sail. The foam is tailored to match the sail cut, and increases the diameter of the sail roll when reefing. A larger diameter of the sail roll gathers in more sailcloth per turn and the draft is reduced by varying amounts along the luff extrusion.

Together with the "free turn" (See chapter 12, **"Reefing"**) this can give the best reefed sail shape.

7.3 Determining the length of the pendant

To hoist the sail see the description in chapter 11.1.

1. Attach the head of the sail directly to the halyard swivel.
2. Tack the sail at deck level with a piece of rope between the sail tack and the tack snap shackle on the lower bearing assembly.
3. Hoist the sail (See chapter 11.1, **"To hoist the sail"**). Adjust the rope length at the tack so that the halyard swivel attains its top position, i.e. the 5–10° requirement is satisfied, when the halyard is fully tensioned.
4. There should never be less than 80 mm (3 5/32") clearance between the top of the halyard swivel and the top guard when the sail is fully tensioned.

5.

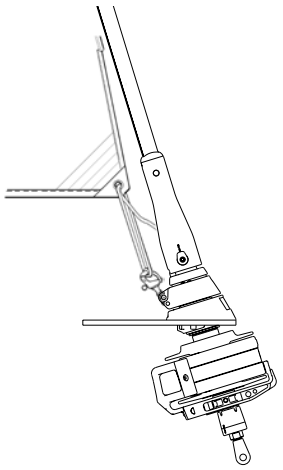


Fig. 7.3.a

Measure the length of the rope while the halyard is still tensioned.

6.

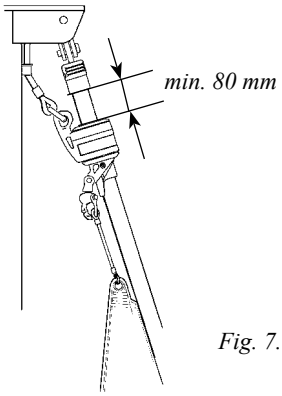


Fig. 7.3.b

Attach a wire pendant corresponding to the length of the rope directly to the head of the sail by a talurit splice. This cannot then be removed unintentionally, lost or exchanged.

7. All the boat's foresails must be adjusted to the correct luff length.

For the halyard routing to work properly, the halyard swivel must be in the correct position to achieve the required angle of 5-10°.

OPERATING MANUAL

To derive the maximum benefit and enjoyment from your Furlex system, we recommend that you study this operating manual carefully.

All safety-related information is indicated by the following symbol.

This information must be followed to avoid damage to the system and the risk of personal injury. The 2-year guarantee on the Furlex system is only valid if the system is operated correctly according to the manual.

Unless you are fitting the Furlex system yourself, you do not need to read the entire assembly manual. However, there are references in the operating manual to certain sections of the assembly manual. It is very important to read and note these cross references.

Any additional fittings recommended in the manual are obtainable from your nearest Furlex dealer. Seldén's home page: www.seldenmast.com

10 Halyard routing

10.1 Summary

IMPORTANT POINTS!

- ☐ Routing the halyard is one of the most important aspects of system assembly for safe, trouble¬-free sailing using the jib furling and reefing system.
- ☐ The angle between the halyard and the forestay must be 5–10°. See fig: 5.4.b. If the angle is less, the halyard may wrap around the luff section when the sail is being furled, possibly damaging the halyard and the luff extrusion. Failure to observe what is happening in this situation may even result in damage to the forestay wire.
- ☐ "Halyard wrap" may cause severe damage to the forestay and put the entire rig at risk. If the sail is furled with the aid of a winch, take great care. It can be difficult to control the tension in the furling line.
- ☐ If the 5–10° requirement is not satisfied, halyard leads or a sheave box must be fitted to avoid halyard wrap.
- ☐ 2 halyard leads are enclosed in the Furlex kit. Check if these are fitted.
- ☐ See also under **"Halyard routing"**, chapter 5.

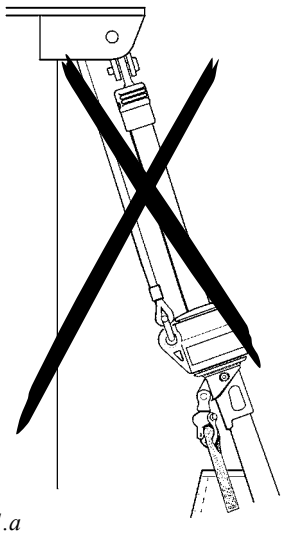


Fig. 10.1.a

May lead to

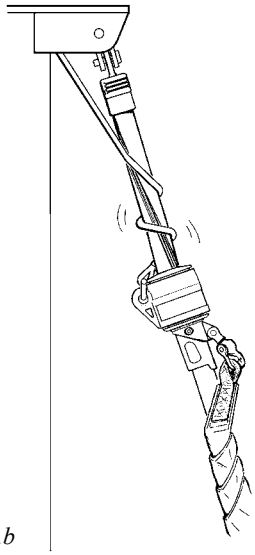


Fig. 10.1.b

When sailing, movement occurs between the wire halyard and the halyard lead. To prevent halyard wear, the halyard lead is made of bronze. This is a softer material than a wire halyard, so the halyard lead will wear before the wire. Halyard leads should be inspected once a year and any sharp edges smoothed with a file. The halyard lead should be replaced when wear reaches 50%. The halyard leads are not covered by the 2-year Furlex warranty.

10.2 Halyard sheave box

A sheave box can also be fitted to the mast to meet the 5–10° requirement. The sheave box will not damage the halyard, nor is it worn by the wire. Installation is more complicated but the box will eliminate the need to replace the halyard leads in future as above.
Newly manufactured Seldén masts on which Furlex is to be fitted are always fitted with a sheave box.

Sheave box kits (with assembly instructions) are obtainable from all Furlex dealers.

See table 5.2.1 and fig: 5.2.a for further information.

10.3 Spinnaker halyard

If the boat is equipped with a spinnaker halyard, this must be kept clear of the Furlex system to avoid halyard wrap. An effective solution is to lead the halyard around the upper shroud and then aft of the spreaders.

Stowing a spinnaker halyard parallel to the Furlex stay is not recommended!

11 Sailing with Furlex

11.1 To hoist the sail

The forestay must be properly tensioned each time the sail is hoisted. You should therefore tension the backstay and any running backstays before hoisting the sail.

1. Tension the forestay for hard close-reach sailing **before** the sail is hoisted. If the sail is hoisted and firmly tensioned before the forestay, this may put excess strain on the halyard, halyard swivel and sail when the forestay is tensioned afterwards.

2. Lay out the sail on deck. It should be carefully flaked down with the tack turned forward.

3. Turn the tack ring counter-clockwise if the furling line exits on the port side of the drum, or clockwise if it exits on the starboard side.

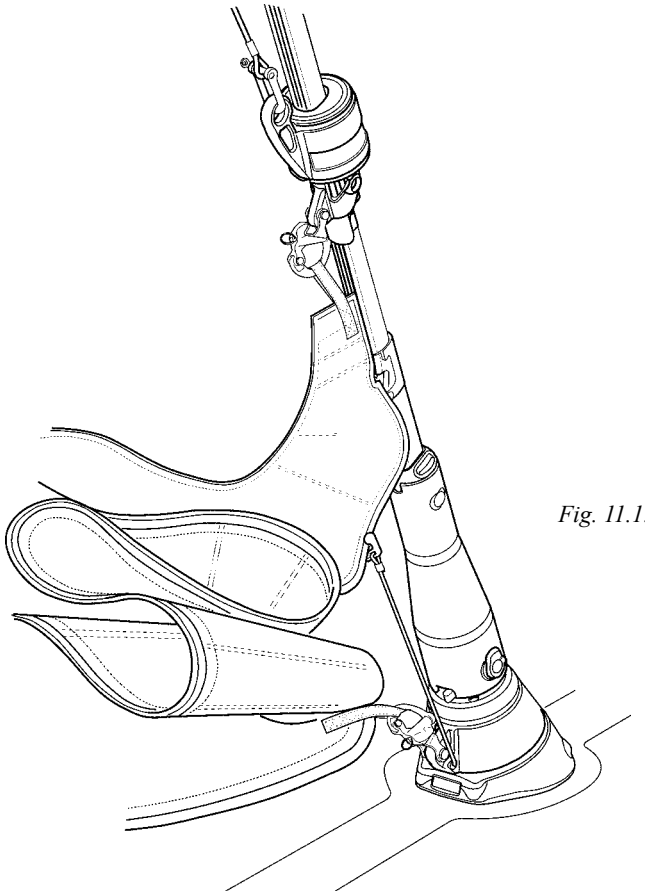


Fig. 11.1.a

4. Attach the tack of the sail to the tack snap shackle.

5. Tie the line of the prefeeder to the hole below the tack snap shackle or to the shackle itself.

6. Tie the sheets to clew. Feed the sheets through the sheet blocks and on to the cockpit. Make a figure of eight knot at each end.

7. Attach the halyard to the upper eye of the halyard swivel.

8. Feed the luff tape through the sail feeder into the luff groove. If the furling line exits on the *port side* of the line drum, the sail should be hoisted in the *starboard groove*. If the line exits on the *starboard side*, use the *port groove*. Hoisting the sail in the "right" groove reduces initial resistance when furling the sail, which then has less of a "fold" along the forestay than if the other groove is used.
9. Hoist the sail. The pre-feeder assists luff tape feed by steering the sail in towards the luff extrusion and sail feeder at a small angle. Tension the halyard until a vertical crease appears in the luff of the sail, then slacken off until the crease disappears. Belay the halyard.
10. Remove the prefeeder from the tack ring.
11. Furl the sail on the Furlex luff section by pulling on the furling line. Let the windward sheet run freely. Keep some tension in the leeward sheet, for example by placing a turn around a winch. It is important to furl the sail tightly and evenly, as a sail which is furled too loosely may blow out a little in strong winds. If the boat is left unattended, the sail may flap until it tears. A very loosely furled sail may also cause unnecessary wear, as the sail roll will swing back and forth in the wind.
12. Check the number of turns of the furling line remaining on the line drum. When the largest sail is furled tightly, there should be 3–5 turns left. To adjust the number of turns, detach the sheet and turn the Furlex luff extrusion by hand until the correct number of turns is on the drum. When furling in strong winds, the sail will roll more tightly, requiring more turns on the line drum and meaning that more line will be needed. Make sure you always have sufficient turns of line on the drum.
13. Check that the halyard swivel is at least 80 mm (3 5/32") from the top guard and that the **halyard angle satisfies the 5–10° requirement.**
14. Once all these points have been checked, mark the halyard as shown in the diagram to prevent overtensioning by a winch or when the forestay/ backstay is adjusted. Mark the maximum tension position of the backstay adjuster.

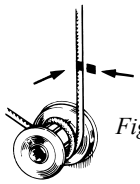


Fig. 11.1.b

15. The forestay tension can now be adjusted without putting too much strain on the halyard.

Warning! Never tension the halyard when the sail is reefed or furled.

11.2 Unfurling the sail

(Partial unfurling: See chapter 12, **"Reefing"**)

1. Release the furling line and the windward genoa sheet. Allow these to run freely while the sail is being unfurled.
2. For a controlled unfurling manoeuvre, it is best to place a turn of the furling line around a winch or a half-turn around a cleat. This introduces some drag, which is particularly useful in stronger winds.
3. Place a turn of the leeward genoa sheet around a winch and unfurl the sail by pulling in the sheet. Once the wind catches the sail it will unfurl more easily. The best point of sail for unfurling is between close reach and beam reach, as the wind will then fill the sail quickly.
4. Place a few more turns of the sheet around the winch and sheet the sail in to the desired trim.

11.3 Furling the sail

1. Release the windward sheet and ensure that it can run freely.
2. Furl the sail by pulling the furling line. Release the leeward sheet but keep a little tension on it, for example by placing a turn around a winch. It is important to furl the sail tightly and evenly, as a sail which is furled too loosely can blow out a little in strong winds. If the boat is left unattended, the sail may flap until it tears. A very loosely furled sail may also cause unnecessary wear, as the sail roll will swing back and forth in the wind.
3. Belay the furling line carefully. If the boat is left unattended, the furling line should be belayed on a cleat for safety.

If the furling line is accidentally released, the sail may unfurl and flap unchecked in strong winds. If left for any length of time, it could be damaged irreparably!

If the boat is left for a relatively long period, it is a good idea to take down the sail and stow it below deck. It is then protected from UV radiation and dirt. Alternatively, a sail cover ("furling tube") can be used to protect the sail.

12 Reefing

The size of the working sail area is infinitely variable with a jib furling and reefing system. Even if the sail is designed as a furling sail incorporating foam etc. and the Furlex system is equipped with a "free turn" (see below), a reefed sail can never achieve the same efficiency as an unreefed sail of equal size. If the boat is equipped with more than one furling sail, these can be changed to suit the different wind conditions.

12.1 Free turn

Furlex is equipped with a tack swivel, meaning that furling of the tack is delayed by one revolution in relation to the luff extrusion. This causes the sail to be flattened out a little before the tack and the foot are furled. Since the tack is reinforced by several layers of sail cloth, this will increase the sail roll more with each revolution than the rest of the luff , thereby impairing the shape of the reefed sail. Furlex compensates for this by means of the tack ring delay.

We refer to this function as the "Free turn".

12.2 Reefing under sail

☐ In strong winds it may be necessary to reef the sail. It is important then to furl the sail tightly, as this both preserves the sail and gives it a better shape.

☐ The best point of sail for reefing is on a close reach to beam reach. The wind will then partly fill the sail and help to improve its shape when reefed.

☐ If using a winch for the furling line, first check that there is no obstruction which may interrupt the furling operation and possibly cause damage.

1. Slacken off the leeward sheet until the sail just begins to flap along the luff.
2. Pull in the furling line so that the sail is furled and flattened out. Belay the furling line.
3. Repeat the procedure as required to obtain the desired sail area.

If using a winch for the furling line, first check that there is no obstruction which may interrupt the furling operation and possibly cause damage.

12.3 Setting a reefed sail from the furled position

☐ You will achieve the best sail shape by first unfurling the sail completely and then reefing down to the appropriate size. Pull in the furling line and keep the sheet well tensioned. The sail will then form a tight roll and its shape will be improved.

☐ If the wind is too strong, or there are other reasons for not wanting to unfurl the sail completely, it can be reefed from the furled position. The sail should then be furled relatively tightly. The sail cannot be expected to have as good a shape when using this method. Wear on the sail is also increased.

12.4 Adjusting the sheeting position

When the sail is reefed, it may be necessary to adjust the sheeting position. For a sail with a low clew, the sheeting position has to be adjusted even when the sail is slightly reefed, a sail with a high clew requires less adjustment. See fig. 12.4.a. As a rule, however, **you must be prepared to adjust the sheeting position as necessary to give the best sail trim.**

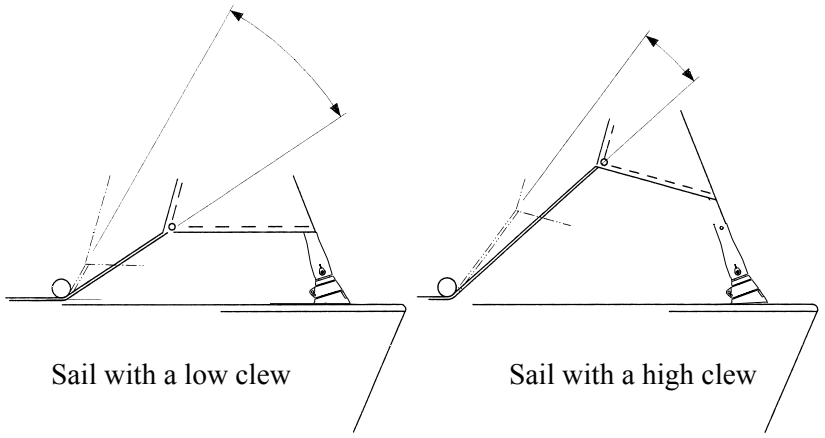


Fig. 12.4.a

The angular variation of the sheet relative to the deck is less for a high-clewed sail. The comparison is based on the same number of furling revolutions.

Adjustment of the sheeting position is made considerably easier if a floating sheet point arrangement is used.. The traveller position is adjusted along the track by means of a line running through a block in the front of the track. The line is best routed to the cockpit where it is secured. The traveller position can also be adjusted under load with the aid of a winch.

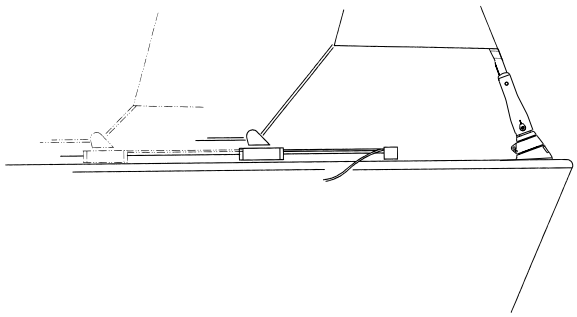


Fig. 12.4.b

Many furling foresails have markings in the foot for different reefing positions. After you have tested combinations of sail area and sheeting position to see which function satisfactorily, you can use these markings as a reference and mark suitable sheet points on the track.

13 Furlex for racing

Many racing yachtsmen have exploited the advantages of the jib furling and reefing system with great success. The sail can be partly furled before the start, giving good visibility and easy manoeuvring of the boat. Just before starting, the sail is unfurled and the boat crosses the line under full sail. If the boat has a small crew, the advantages are obvious.

The Furlex system can be reconfigured from a furling system to a twin-groove racing headfoil if the halyard swivel is lowered below the sail feeder. To remove the sail feeder see chapter 17.2, **"Dismantling"**. Lower the halyard swivel and refit the sail feeder. The twin grooves now makes swift sail changes possible.

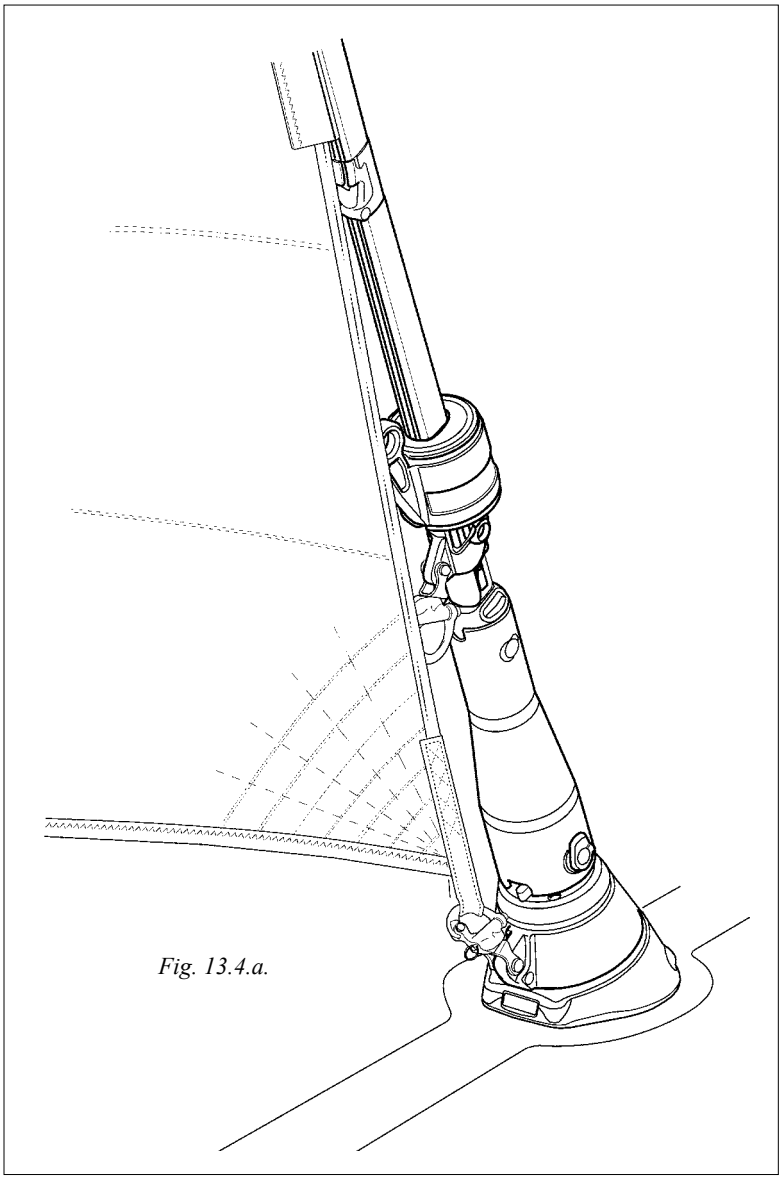


Fig. 13.4.a.

14 Adjusting the forestay length

Furlex 400 TD is only supplied without a rigging screw.

14.1 To lengthen the forestay

The forestay can be lengthened by fitting extra toggles, see table 3.3.3. Several toggles are usually required to change the mast rake noticeably. These can only be fitted at the upper end of the system. On a Furlex with an Ø12 mm forestay of the normal length (20000 mm), the masthead is moved 220 mm aft if the forestay is lengthened using a standard toggle (H=65mm).

14.2 To shorten the forestay

To shorten the Furlex system the forestay wire as well as the luff section have to be shortened. See **"Dismantling"**, chapter 17 and **"Assembly of the Furlex system"**, chapter 4.

NB: The system must never be shortened by removing the lower Furlex toggle between the forestay and the lower bearing assembly. (See "Forestay attachment-guiding principle", chapter 3.1 and "Hull attachment", chapter 3.3).

15 Maintenance of the Furlex system

To ensure that the system rotates easily and functions reliably year after year, regular maintenance should be carried out. This should be done once a year, or perhaps when the boat is unrigged at the end of each season. Maintenance is simple, even when the Furlex is rigged on the boat. Halyard leads should be inspected once a year and any sharp edges smoothed with a file. The halyard leads should be replaced when wear reaches 50%

15.1 Lubricating the lower bearing assembly

First remove the line guide and the drum halves (see chapter 17). For best results, rinse the system with fresh water and let it dry. Lubricate all ball bearings as described below using the grease enclosed with the Furlex kit. Lubricating holes Ⓐ and Ⓒ are for the most important bearings to be greased, as the Furlex system rotates around these. Lubricating holes Ⓑ and Ⓓ are for tack ring bearings. Unscrew the adjustment screw at the bottom of the lower bearing part approx 20mm. If the stroke does not permit this, the stay must be disconnected from the boat.
Note. Secure the mast with a halyard before the stay is disconnected (see chapter 3.5.3). The bearings of the through-deck fitting Ⓔ and Ⓕ have Torlon® balls and do not need lubrication. However, they should be rinsed with fresh water.

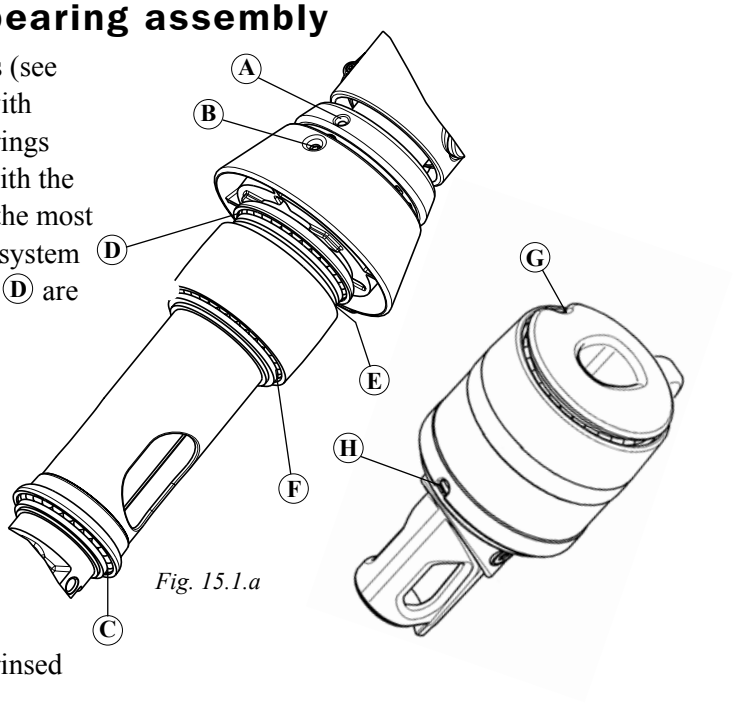


Fig. 15.1.a

Tools: 1 set of Torx keys
1 set of Allen keys (metric)
1 adjustable spanner
1 pair of long-nosed pliers if the stay has to be disconnected

Ⓐ , Ⓑ and Ⓒ
Press grease into the holes Ⓐ , Ⓑ and Ⓒ .

Ⓓ
Unscrew the adjustment screw or disconnect the forestay as per instructions above. Press grease into the hole Ⓓ.

Reset the adjustment screw to its original position. There should be a gap between the lower edge of the tack ring and the through-deck fitting of 4-5 mm (3/16") when forestay is tensioned. Refit the line guide and drum halves.

15.2 Lubricating the halyard swivel

1. Lower the halyard swivel down to the sail feeder.
2. Press grease into the upper bearing through the recess Ⓖ and into the lower bearing through opening Ⓗ in the plastic cover.

15.3 Cleaning the Furlex

Wash and rinse the entire Furlex system with fresh water and a mild detergent to remove dirt and salt crystals.

Note! Some detergents contain substances which can cause aluminium to corrode, so it is important to rinse all detergent off thoroughly.

When the parts have dried, the anodized surfaces of the luff extrusions can be treated with a silicon-free boat polish or wax. This offers good protection and prevents particles of dirt from adhering and then soiling the sail. The stainless steel components can be treated with a suitable polish.

15.4 Storage

The Furlex system is preferably stored with the mast during the winter.

Never wrap a damp or unwashed Furlex in plastic or other impervious material.

In areas where frost can occur, the Furlex should be stored in a dry place or with its centre sections raised. This is to avoid ice damage to luff sections in sub-zero temperatures.

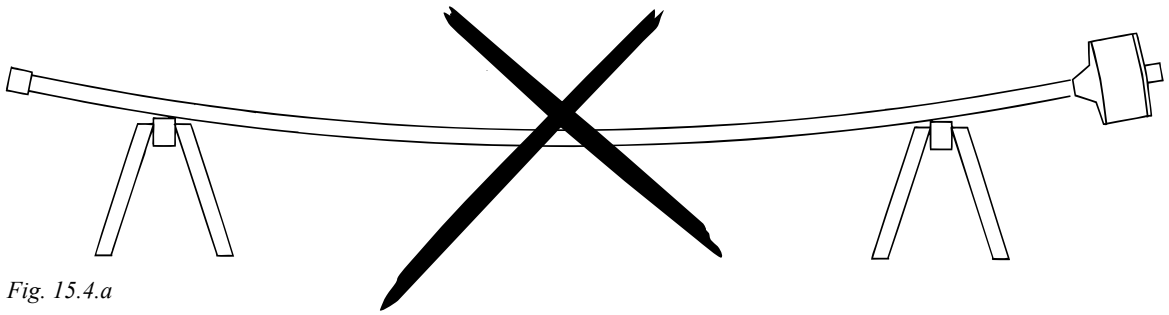


Fig. 15.4.a

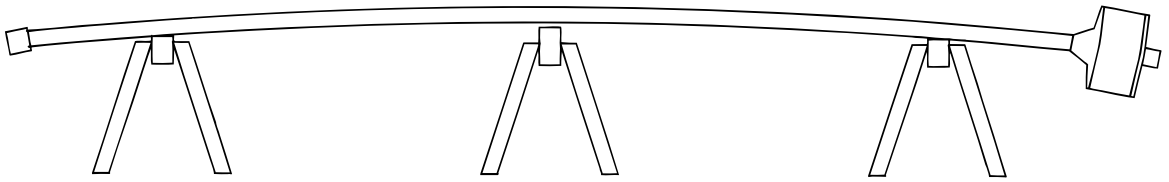


Fig. 15.4.b

The lower bearing assembly can be left in the boat during winter storage. In this case ensure that the anchor well is dry and well ventilated.

The lower bearing assembly can equally well be dismantled and removed from the boat for storage in a clean and dry location. To remove the line guide and line drum see **"Dismantling"**, chapter 17.3 & 17.4. Once disconnected from the forestay fitting, the lower bearing assembly can be lifted out of the through-deck fitting.

16 Rigging

The Furlex system is best transported and rigged together with the mast.

16.1 Fitting the Furlex on a stepped mast

1. Slacken the **backstay** as much as possible, but make sure that any rigging screw is not unscrewed so far that the threads are no longer visible "on the inside".
2. Pull the masthead forward using the genoa halyard. Secure the halyard using a "D" shackle or tie it to a strong deck fitting. Do not use the halyard snap shackle for safety reasons.

> ⚠ **Always use a strong "D" shackle or tie the halyard.**

3. Tie a strong, flexible line around the luff extrusion. Make two clove hitches, the upper approx.1 m from the top, taping over the knots so that they cannot slide.
4. Hoist the stay using a spare halyard.
5. "Go aloft" and attach the top end of the Furlex system to the forestay attachment. Always use a proper bosun's chair. If there are no free headsail halyards use the main halyard. For further information, see **"Working aloft"** in Seldén Mast AB's "Hints and Advice" or contact your Furlex dealer.

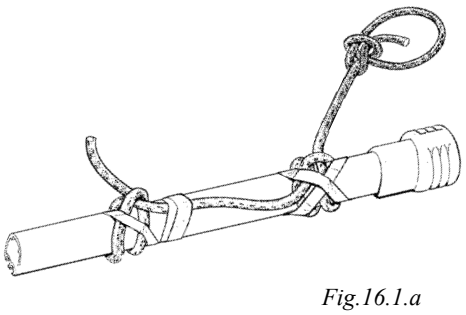


Fig.16.1.a

6. Attach the stay to the headbox and then to the lower bearing assembly. The split pin for the clevis pin should be opened by ~ 20°. It will then retain its shape on dismantling, enabling it to be used again.

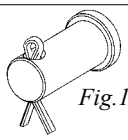


Fig.16.1.b

7. Lower the adapter tube and fit it to the cardan ring of the lower bearing assembly. Fit the bushes acc. to fig. 16.1c. Tighten the screws ① firmly. Tighten the locking screws ②. Use locking adhesive.
8. Adjust the luff extrusion so that the marking (see page 26) is at the same level as the adapter at Ⓐ. Tighten the extrusion screws ③ firmly.
9. Tension the forestay to 20% of the wire's breaking load. As the tension on the forestay cannot be measured easily when it is encased in the luff extrusion, this can be done using the backstay. Owing to the difference in the angle of these stays relative to the mast, this is equivalent to approx. 15% of the backstay's breaking load on a masthead rig, assuming that it is the same diameter as the forestay. (Forestay tension = approx. 1.25 x backstay tension.)

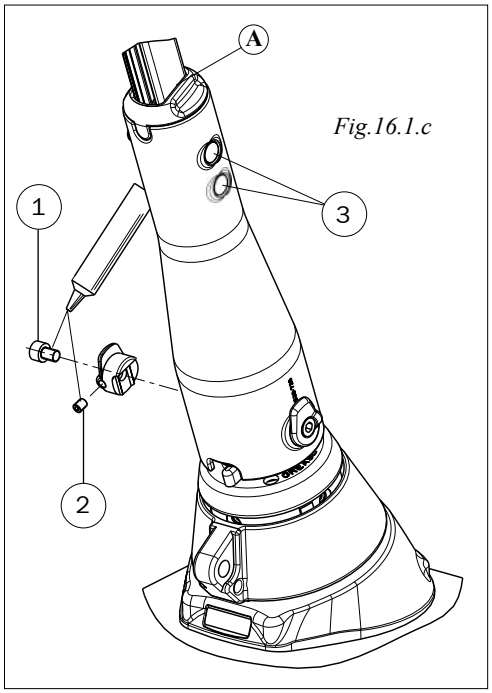


Fig.16.1.c

A firmly tensioned stay offers the least furling resistance.

For further information, see Seldén Mast AB's "Hints and Advice" or contact your Furlex dealer.

16.2 Stepping the mast with Furlex fitted

1. Lay the mast with the front uppermost.
2. Connect the top end of the Furlex system to the forestay attachment.
3. Lift the mast with the Furlex system lying on the leading edge of the mast.
4. Have one person watching the Furlex system to ensure that it does not get caught when lifting the mast. Keep the end of the stay outside the deck area in order to avoid damage.
5. Attach the stay to the boat as described in chapter 16.1 section 6–8.

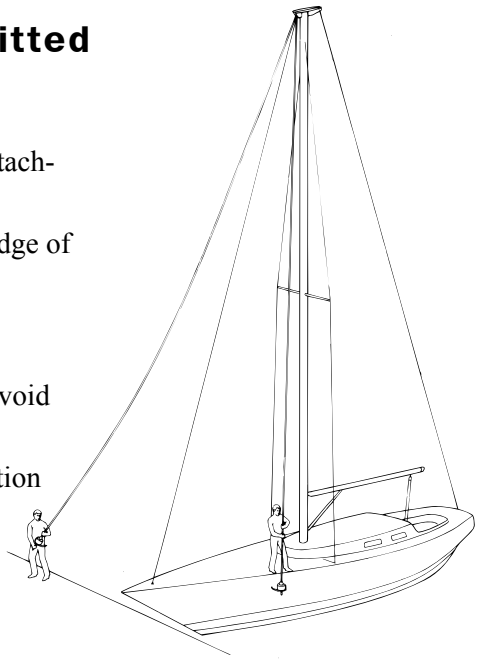


Fig. 16.2.a

17 Dismantling

NOTE! Do not dismantle the halyard swivel or lower bearing assembly.
You will find it difficult to re-assemble them correctly
(the ball-bearings are loose and difficult to refit!).
Contact your Furlex dealer if service is required.

17.1 Halyard swivel

The halyard swivel can be removed from the system by removing the top guard and sliding it over the end of the forestay wire. The stay also has to be detached from the mast.

Alternatively, it can also be pulled downwards in conjunction with dismantling the sail feeder and removing the lower bearing assembly.

17.2 Sail feeder

Removing the sail feeder:

1.

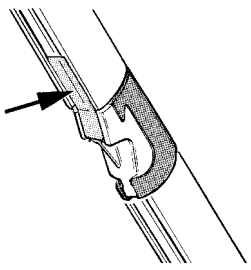


Fig. 17.2 a

Secure the stainless steel sail feeder with adhesive tape to prevent it from falling overboard during disassembly.

2.

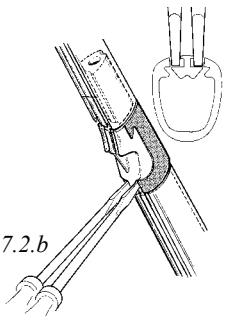


Fig. 17.2.b

Insert two small screwdrivers into the small slots as per the diagram. Force the screwdrivers apart so that the sides of the sailfeeder connector are pressed out and its concealed clips are released.

3.

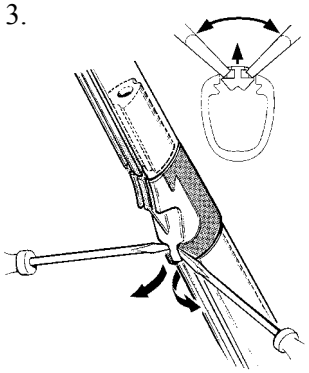


Fig. 17.2.c

Continue the movement of the screw-drivers and the sail feeder is "lifted out" of its seat.

Reinstalling the sail feeder:

4.

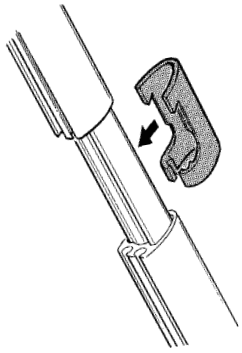


Fig. 17.2.d

Press on the sail feeder connector from the front of the luff extrusion.

5.

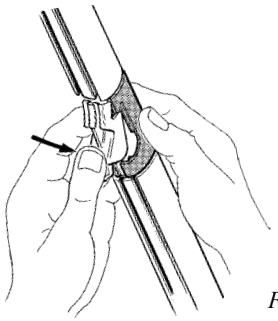


Fig. 17.2.e

Clip the sailfeeder into th connector's top recess, then press the sail feeder's lower edge until it snaps into place.

17.3 Line guide

1. Unwind all the line from the line drum. Note the number of turns of line (for reassembly).

2.

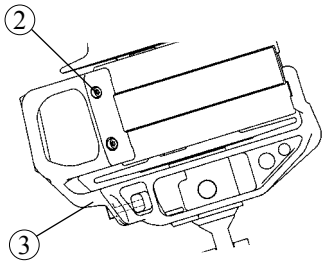


Fig. 17.3.a

Loosen screws ② and slacken screw ③ off a few turns.

3.

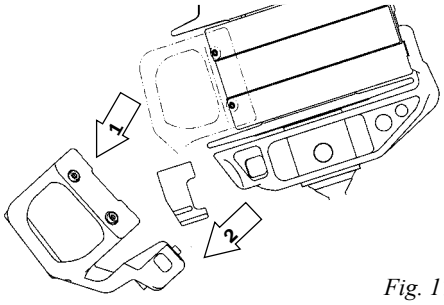


Fig. 17.3.b

Lower the line guide fitting and remove it.

4. Remove the line guard housing from the line drum.

17.4 Line drum

1. Dismantle the line drum halves by loosening the 2 screws.

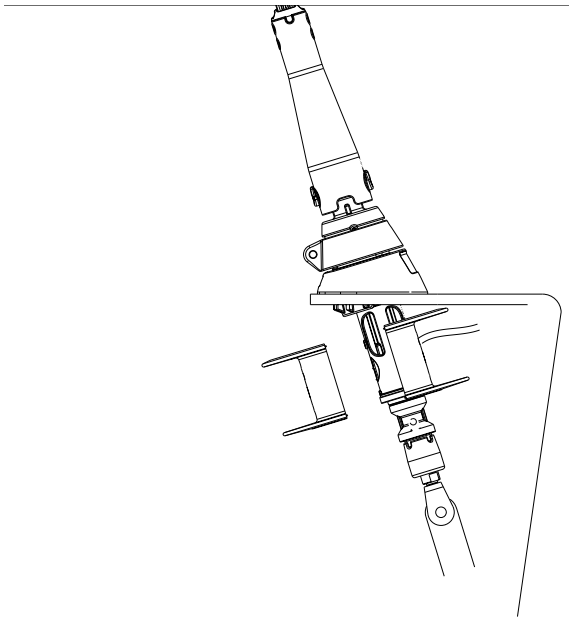


Fig. 17.4.a

17.5 Wire terminal

1. Remove the terminal part from the socket. See fig. 17.5.b and fig. 4.5.a.
2. Remove the former at the bottom of the terminal part thread.
3. Replace the terminal part, then loosen it ~2 turns.
4. Tap the terminal part so that the socket is pushed up the wire. If necessary, secure the wire in a vice. There should be at least 10 mm (25/64") of free wire between the top of the socket and the jaws of the vice.
5. Unscrew the terminal part again.
6. Cut all wire strands protruding outside the wedge at the bend (5 mm in on wire) (3/16"). See fig. 17.6.a.
7. Prise the wedge apart slightly by inserting a small screwdriver into the slot and turning. Tap on the screwdriver so that the wedge slides off the wire.
8. Twist the wire strands into the correct positions around the core (counter-clockwise when seen from underneath) and remove the socket.
9. The wire can now be pulled out of the luff extrusion.

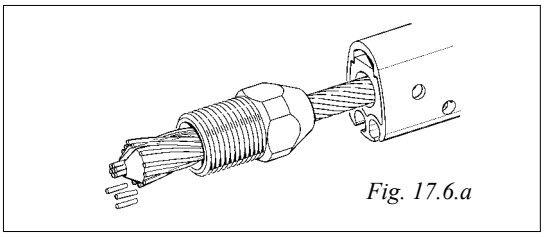


Fig. 17.6.a

NOTE! If the luff extrusions are to be disassembled prior to e.g. replacing a luff extrusion – do not pull out the wire. Go to chapter 17.6.

Prior to reassembly of the forestay:

Check that the shape of the wedge was not damaged on dismantling. If so, replace it.

Cut the wire core flush with the outer strands. Remove any burrs with a file.

The decrease in forestay length which results has very little effect on the mast rake. A decrease of 5 mm in forestay length causes the masthead to move forward 35 mm (1 1/3") on a 20000 mm (65 ½') forestay.

The decrease in length can also be compensated for by an increase in stay tension of 5% of the wire's breaking load compared with before. (However, permanent tension must not exceed 20% of the breaking load of the wire.) If this reduction in wire length is unacceptable, the total decrease can be made equal to a toggle length. The reduced measurement is compensated for by fitting an eye/fork toggle (see table 3.3.2).

The luff extrusion and possibly the sail also should be shortened accordingly.

17.6 Luff extrusion system

For a better understanding of the following instructions, we recommend that you first read the section on assembly in chapter 4.1.

1. Make sure that the luff extrusions are straight and placed on a flat surface.
2. Slide the wedge over the core of the wire again.
3. Push out the locking pin at the lower end of the 660 mm (26") luff extrusion.
4. Hold the luff extrusion firmly and pull the wire's eye terminal. This will bring the forestay, joining sleeves and distance tubes out together, enabling the extrusions to be separated.

If due to contamination or damage this method fails, the connection parts protruding can be drilled out. Use a Ø 8 mm (1/3") drill bit.

Reassembly of the luff extrusion:

1. Check all corners, edges and holes for damage, and file smooth if necessary.
2. Clean the wire and all extrusion parts with fresh water.
3. Insert the wire with joining sleeves and distance tubes from the top.
4. As the forestay progresses down, reassemble the connection parts at each join in turn.
5. Refit the locking pin in the 660 mm extrusion. Use locking adhesive.

18 Troubleshooting

	Problem	Probable cause	Action
18.1	"The sail will not unfurl or will only partly unfurl."	• The jib halyard is wrapped around the luff extrusion.	• Ease the halyard slightly and try to reverse the system. Refer to the Assembly and Operating manual, chapter 5 & 10, **"Halyard routing"**.
		• Another halyard is wrapped around the luff extrusion.	• Furl the system. Free the halyard.
		• The furling line is not free to run or has become tangled.	• Slacken or free the furling line.
		• The forestay is too slack.	• Tension the forestay, first of all by tensioning the backstay adjuster or backstays. If this doesn't help, decrease the length of the Furlex system. Refer to the Operating manual, chapter 14, **"Adjusting the forestay length"**.
		• Dirt and salt in the bearings.	• Rinse the bearings with fresh water and lubricate with Furlex grease.
		• Too much strain on the halyard.	• Ease the halyard off.
18.2	"The sail will not furl, is hard to furl or can only be partly furled"	• The jib halyard is wrapped around the luff extrusion.	• Ease the halyard slightly and try to reverse the system. Refer to the Assembly and Operating manual, chapter 5 & 10, **"Halyard routing"**.
		• Another halyard is wrapped around the luff extrusion.	• Unfurl the system. Free the halyard
		• There is no line left on the drum.	• Unfurl the sail. Ease the halyard. Undo the tack and pull the shackle one turn forward round the system. Tack the sail and tension the halyard (see **"Setting the sail"**).
		• The forestay is too slack	• Increase forestay tension.
		• Excessive wind pressure on the sail.	• Let the leeward sheet off more
		• Windward sheet is not released.	• Release the sheet.
		• The sheet has become tangled.	• Sort out the sheet.
		• The free turn is not functioning.	• Rinse the bearings with fresh water and lubricate with Furlex grease. (see also 18.9).
		• Large turning angles in the furling line route which increase friction.	• Reroute the furling line, avoiding large turning angles.
		• Dirt and salt in the bearings.	• Rinse the bearings with fresh water and lubricate with Furlex grease.
		• The furling line has become tangled on the drum.	• Unfurl the sail and take it down. Rewind the furling line. Unfurl with slight drag on the furling line in future and avoid having too much line on the drum.
		• The line guide fitting chafes against the drum.	• Loosen the fastening screw below the drum and adjust the fitting.
		• The halyard swivel is upside down.	• Fit the halyard swivel correctly.
		• Too much strain on the halyard.	• Ease the halyard off a little.

	Problem	Probable cause	Action
18.3	"The system 'wobbles' when furling and unfurling"	• The forestay is too loose.	• Tension the forestay.
18.4	"The sail unfurls after reefing or furling"	• The sail is not furled tightly enough. • The furling line is not belayed.	• Furl with some drag on the line. • Furl and belay the furling line.
18.5	"The sail is hard to hoist"	• The luff tape is too thick. • The sail is caught on something or is not sufficiently loose on the foredeck. • Fault in halyard routing. • Dirt and salt in the luff groove.	• Return the sail to the sailmaker and refer to Furlex manual, chapter 7.1.1 **"Table of sail measurements"**. • Arrange the sail better on the foredeck. • Check the sheaves, winch etc. • Clean the luff groove.
18.6	"The luff cannot be tensioned"	• The halyard swivel comes into contact with the top guard. • The angle between the forestay and the halyard is too great.	• The luff of the sail is too long. Have the sail shortened by the sailmaker. • Shorten the sail or move the halyard lead up.
18.7	"The sail cannot be taken down"	• The halyard is wrapped around the top of the luff extrusion. • The halyard wraps around the luff extrusion as the sail is coming down. • The halyard is stuck.	• Ease the halyard off and try to reverse the system. Refer to the Assembly and Operating Manual, chapter 5 & 10 **"Halyard routing"**. • Tension the halyard manually keeping a slight drag on it while taking the sail down. • Check the halyard routing (sheaves, stoppers etc)
18.8	"The sail's UV protection is on the inside of the furled sail"	• The furling line is wound on the drum in the wrong direction.	• Remove the sheet from the sail and gather the sail around the Furlex system with a rope. Pull on the line until the drum is empty. Wind a couple of turns on the drum by hand in the right direction. Unfurl the sail. Furl again, checking the number of turns of furling line on the drum.
18.9	"The sail is wrinkled at the tack"	• The tack ring was twisted in the wrong direction before tacking the sail. • The sail is old or incorrectly cut.	• Unfurl the sail and ease off the halyard. Undo the tack snap shackle. Rotate the tack ring "around the system" and retack the sail. Furl slowly and check that the furling of the tack is retarded by one revolution in relation to the luff extrusion. • Consult your sailmaker.
18.10	"The leach flogs despite sheeting hard"	• Incorrect sheeting point. • Incorrectly tensioned leach line. • The sail is old or incorrectly cut.	• Move the sheeting point forward. • Adjust the leach line (Consult your sailmaker). • Consult your sailmaker.
18.11	"The leach closes (bends inwards)"	• Incorrect sheeting point. • The sail is old or incorrectly cut.	• Move the sheeting point backwards. • Consult your sailmaker.

19 Checklist

Go through the checklist below and make sure that all the important instructions have been carried out. This will ensure that the Furlex system functions safely and reliably under all conditions.

19.1 Points to check before sailing	See chapter
☐ Check that the angle between the halyard and forestay is 5–10° when the sail is hoisted.	5
☐ Check that the clearance between the halyard swivel and the top guard is not less than 50 mm.	7.1
☐ Do all the sails used have the maximum luff length or an extension pendant?	7.1
☐ Check that no halyard can get caught in the halyard swivel or wrapped around the luff extrusion.	5.3
☐ Check that the line guide eye does not deflect the furling line too much, as this can cause extra friction and wear.	6.3
☐ Check that the free turn is functioning, i.e. the tack swivel is turned in the right direction. A certain load on the sheet should cause the luff section to rotate one revolution before the tack rotates.	12.1
☐ Check that the tack ring does not touch the through-deck fitting and cause extra friction.	4.2
☐ Check that the line guide fitting does not contact the line drum and flanges.	4.3
☐ Check that the Furlex stay articulates freely at the upper and lower attachment.	3.1
☐ Check that all the split pins are secured.	3.3

We are sure that your Furlex will give you many years of enjoyment and wish you and your crew happy sailing.

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Sweden: *Seldén Mast AB, Tel +46 (0)31 69 69 00, e-mail info@seldenmast.com* ***UK:*** *Seldén Mast Ltd., Tel +44 (0)1329 50 40 00, e-mail info@seldenmast.co.uk* ***USA:*** *Seldén Mast Inc., Tel +1 843-760-6278, e-mail info@seldenus.com* ***Denmark:*** *Seldén Mast A/S, Tel +45 39 18 44 00, e-mail info@seldenmast.dk* ***the Netherlands:*** *Seldén Mid Europe B.V., Tel +31 (0)111- 698 120, e-mail info@seldenmast.nl* ***France:*** *Seldén Mast SAS, Tel 33 (0) 251 362 110, e-mail info@seldenmast.fr*

595-240-E Printed in Sweden